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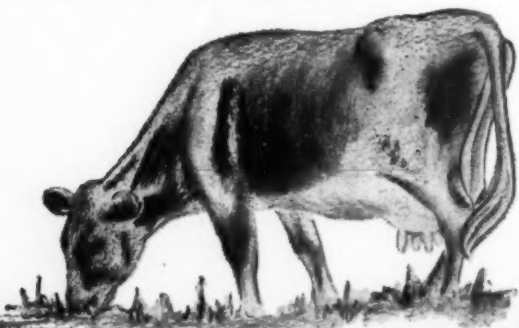


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EDITORIAL STAFF: W. A. Aitken, Editor in Chief; Donald A. Price, *Associate Editor*; H. E. Kingman, Jr., *Managing Editor*; Eva G. Bailey, *Assistant to the Editors*.

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## Correspondence

December 4, 1958

Dear Sirs:

We have received two advertising solicitations for our purchase of supplies of a quarterly magazine entitled *Your Family Pet*, suggesting that we distribute copies to our clients as a helpful service to them. This publication appears to have the endorsement of the American Veterinary Medical Association, the American Animal Hospital Association, and the editors of *Veterinary Medicine*.

The basic concept of a pet information magazine to further good public relations for the veterinary profession is excellent. However, one article appearing in the first issue of *Your Family Pet* destroys much of its usefulness. I refer to the article by Mr. C. E. Harbison, "There Are No Bad Dogs."

This article would seem to refute the need for selective breeding for good disposition. The skittish, untrustworthy dogs, so common in certain breeds, are only the result of bad ownership if Mr. Harbison's views are correct. This is not in agreement with scientific opinion. An editorial entitled "Inherited Canine Defects—Our Attitude Toward Them" appeared in the November 15 issue of the *JOURNAL* of the AVMA, page 526. In this article, it is clearly stated that mental attributes that make dogs unfit for work or as pets are among the most common and most serious of hereditary defects.

I cannot accept Mr. Harbison's reasoning, and don't wish to risk insulting the gentle well-meaning client who has had the misfortune of acquiring an unmanageable, fear-biting type of pet. Our purpose should be to counsel our clients fairly and honestly. I believe it is unwise and detrimental to the future of dog popularity to encourage people to keep dogs that may at any moment make their owners defendants in a civil court action.

All of us have seen dogs of unstable type charmed by the patient handling of a dedicated person. However, these same dogs are seldom trustworthy when approached by a stranger. They are also the bane of veterinarians called upon to minister to their ills.

May the editors and the publisher of *Your Family Pet* continue in their worthwhile effort to develop a client-information magazine for distribution from veterinary hospitals. However, let us hope that future issues won't be spoiled by the inclusion of questionable articles.

Very truly yours,  
s/RALPH C. VIERHELLER  
Whittier, Calif.

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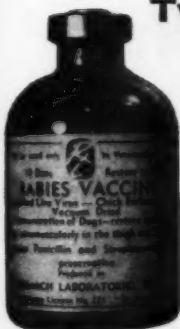
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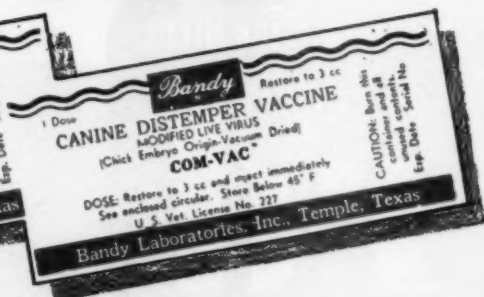
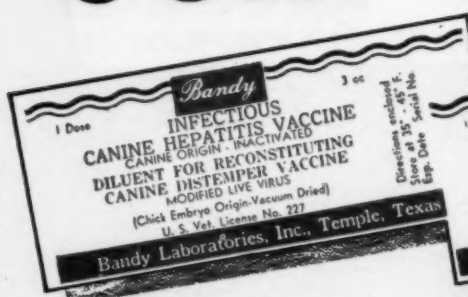
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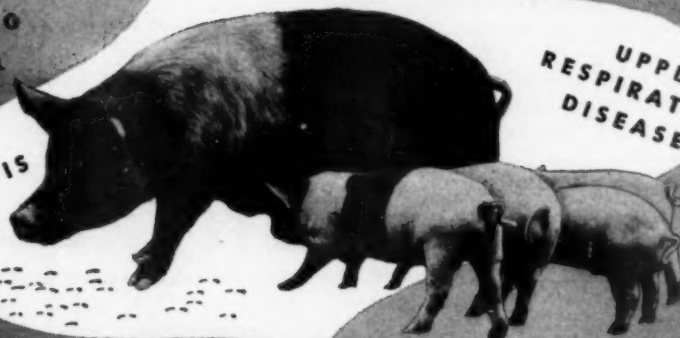
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REFERENCES: 1. Bull, W. S.; N. Amer. Vet., in press. 2. Henry, E. T., and Blackburn, E. G.; Vet. Med., in press.

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\*Jones, S. V.; Belloff, G. B., and Roberts, H. D. B.: Vet. Med. 51:413 (Sept.) 1956.

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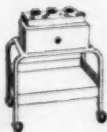
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## Washington News



**U.S.D.A.**—Amended regulations to the **Poultry Products Inspection Act** (P.L. 85-172), which became effective Jan. 1, 1959, were published in the Federal Register, Dec. 10, 1958. Copies of the amended regulations may be obtained by writing the Poultry Inspection Division, Agricultural Marketing Service, U.S.D.A., Washington, D.C.

**Meat Inspection Division** reports that since 1951, it has been training its inspectors in ways to safeguard the nation's meat supply against possible radioactive contaminations. Since autumn, 1958, personnel in other agencies of U.S.D.A., have been receiving similar instruction. The course covers many aspects of the subject matter from "cutie pies" to "coffins," including instruction in terminology, calibrating, computing, and the use of radiation detection equipment. The "professors" are Drs. **R. K. Somers**, chief staff officer for procedures and training, **J. D. Lane**, and **R. P. McCoy, Jr.** Drs. Lane and McCoy spent six months in 1957 studying the effects of atomic bomb tests in Nevada.

**Picture Story No. 115—"Agriculture Research for 1958,"** which shows some of the research accomplishments of U.S.D.A., will be issued soon. It may be ordered from: Division of Photography, Office of Information, U.S.D.A., Washington 25, D.C.

★ ★ ★

**HEW**—Food and Drug Administration list of **approved food additives** (Federal Register, Dec. 9, 1958) contains a list of chemicals and other additives. Included in same Federal Register were proposed regulations governing the new food additives law (P.L. 85-929). **Food manufacturers**, following publication of proposed regulations, **want F.D.A. to delay putting the new code in effect** because of complications involved. Among reasons advanced by some industry spokesmen: some states are setting up their own standards, which might cause widespread confusion; believe F.D.A. best qualified to police the industry, but now lacks sufficient personnel; that imported foods are not subject to same strict standards as domestic, therefore, have a competitive advantage.

**Aid to medical education** continues in the news as **Secretary Fleming**, in one of his recent conferences, indicated that he may request various health agencies to give their views on medical education, particularly what they consider to be "fair shares" of costs to be met by federal, state and local governments, and private groups and institutions.

**Surgeon General Burney's (PHS) Consultants Committee on Medical Education**, recently appointed, has two studies going—one on construction costs of newer schools, the other on financing of medical school operations.

★ ★ ★

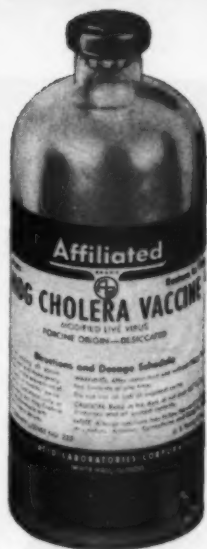
**Military**.—A few vacancies exist in the Army Veterinary Corps for those desiring to fulfil their military obligation under the provisions of the Universal Military Training and Service Act (see JOURNAL, Sept. 15, 1958, adv. p. 12).

Appointments in the Veterinary Corps, Regular Army, to fill existing vacancies, have been offered to Captains **Jerry L. Adcock**, (COL '54), **Millard L. Tierce, Jr.**, (TEX '46), and **Roland J. Gibbs**, (ISC '44). **Roy Resseguie**, (ISC '36), has been promoted to the grade of Colonel.

★ ★ ★

**Miscellaneous**.—President **Eisenhower** has given his approval to the organization of a science information service under the **National Science Foundation**. Purpose is to help coordinate the growing volume of scientific information published here and abroad so that it can be made available to scientists.

"**The Advancement of Medical Research and Education**" is the title of a final report of a group of consultants (Bayne-Jones Committee) appointed by former **HEW Secretary Folsom**. It is a **survey of medical research activities** of the Department of Health, Education and Welfare, and their relationship to medical education. The report may be obtained from Superintendent of Documents, Government Printing Office, Washington 25, D.C., for \$60.



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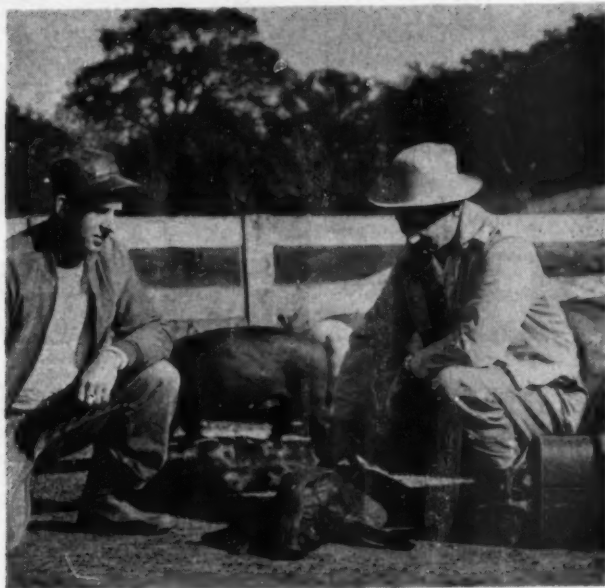
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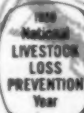
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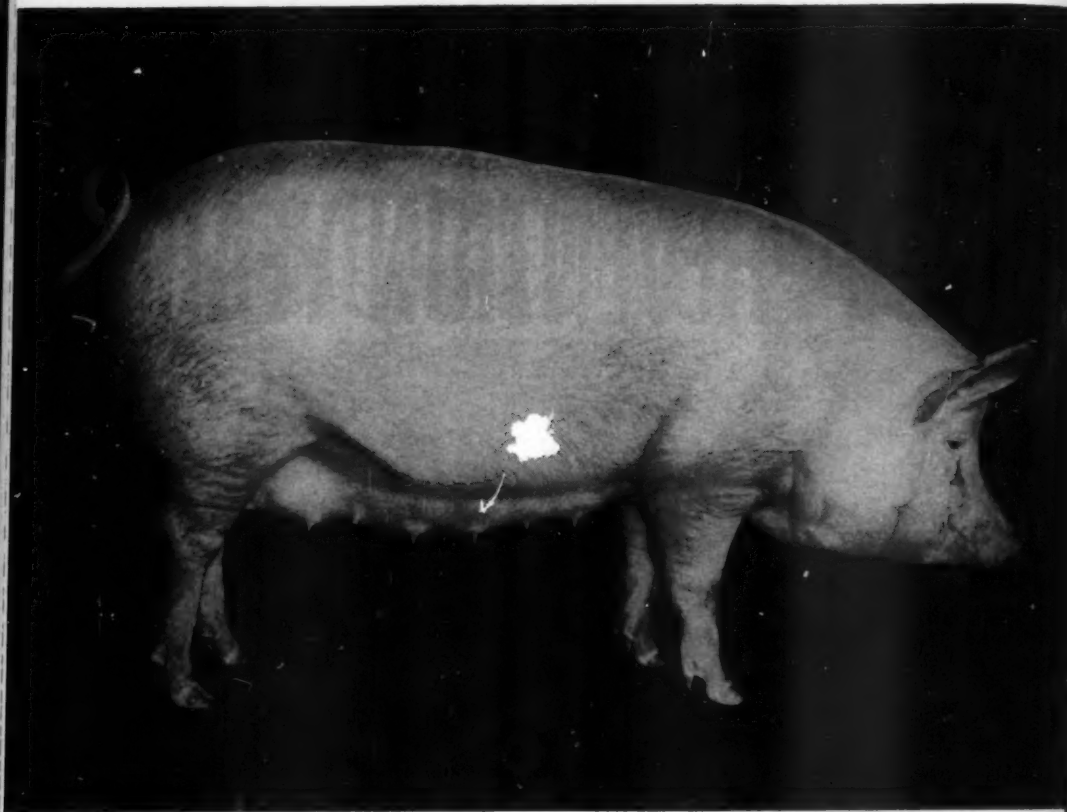
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## A Clinical and Radiological Study of Canine Bone Neoplasms. Part I\*

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*Philadelphia, Pennsylvania*

THIS STUDY was undertaken to supplement the literature on canine bone tumors of skeletal origin and to stimulate further interest in these lesions. Several reviews of the subject<sup>4,5,9,10</sup> have appeared in recent years; however, there is still a paucity of information in this field.

The 75 bone neoplasms reported (table 1) were seen at the University of Pennsylvania veterinary clinic from July, 1952, to June, 1958. The diagnosis was made histopathologically in 44 dogs and clinically and radiologically in 31. Thirty of this latter group manifested the typical clinical and radiological characteristics of a malignant bone tumor, suggesting osteosarcoma.

### DISCUSSION OF CASES

Some of the more interesting case histories as well as the clinical, radiological, and pathological findings will be discussed according to the site of origin of the tumor.

#### SCAPULA

The only tumor of the scapula was primarily osteolytic. It arose from the supraspinatus fossa, widely infiltrated the soft tissues, and produced numerous osteoblastic lung metastases.

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\*Part II. A Pathological Study of Canine Bone Neoplasms (in preparation).

#### HUMERUS

All of the ten tumors of the humerus arose from the proximal metaphysis and most were primarily osteolytic.

Radiographs showed that one tumor (case 8) had destroyed the entire proximal third of the humerus including part of the articular cartilage; periosteal reaction was minimal (fig. 1). Euthanasia was advised because of lung metastasis. A large circumscribed neoplasm (10.0 by 9.0 by 7.5 cm.) involving the upper humerus and adjacent soft tissue was found at necropsy. When sectioned it was an extremely friable, markedly osteolytic growth with a variegated appearance ranging from reddish black to grayish white.

The prescapular and axillary lymph nodes were enlarged and reddish brown; the cut surface had a variegated color. Eight small, opaque, oval growths, from 0.5 to 1.0 cm. in diameter, were found involving all lobes of the lung. Both tonsils were swollen, reddened, and somewhat firm.

Histologically, there were many typical reticulum cells with the grooved or folded nuclei and irregular cytoplasmic boundaries. Mitosis was prominent. There was a distinctly reticular, occasionally fibrillar, background. The tonsils and lymph nodes showed a reactive hyperplasia with no discernible neoplastic areas. This was the only reticulum cell tumor in the series.

#### RADIUS

All of the 16 radial tumors arose from the distal metaphysis. In some cases there was minor trauma to the unsuspected

TABLE 1—Primary Bone Tumors in Dogs

Case	Age (yr.)	Sex	Breed	Site	Clinical signs	Metastases	Diagnosis
1	9	M	Boxer	Scapula (dist. 1/3-rt.)	2 mo.; painful bony mass; dyspnea.	Lungs (R)	Osteosarcoma (R)
2	6	F	Dane	Humerus (prox. 1/3-left.)	4 mo.; lameness and swelling.	Chest x ray not taken.	Osteosarcoma (R)
3	7	M	Collie	Humerus (prox. 1/3-left.)	1 mo.; lameness and swelling; dyspnea.	Lungs (R)	Osteosarcoma (R)
4	11	M	Dane	Humerus (prox. 1/2-left.)	1 mo.; lameness and swelling.	Negative chest x ray.	Osteosarcoma (B)
5	—	—	Boxer	Humerus (prox. 1/3-left.)	Lameness and swelling.	Negative chest x ray.	Osteosarcoma (R)
6	6	F	Boxer	Humerus (prox. 1/3-rt.)	14 mo.; lameness and swelling.	Chest x ray not taken.	Osteosarcoma (R)
7	9	M	Boxer	Humerus (prox. 1/3-left.)	Swelling; edema and foreleg paralysis.	Absent (N)	Osteosarcoma (N)
8	1.5	M	English Setter	Humerus (prox. 1/3-left.)	5 mo.; severe pain; lameness, swelling, and weight loss.	Lungs (R & N)	Reticulum cell Sarcoma (N)
9	8	—	Golden Retriever	Humerus (prox. 1/3)	2-3 mo.; lameness, swelling.	Negative chest x ray.	Osteosarcoma (R)
10	7	—	Collie	Humerus (prox. 1/3)	Lameness and swelling.	Negative chest x ray.	Osteosarcoma (R)
11	7	F	Boxer	Humerus (prox. 1/3-left.)	4 mo.; swelling, edema, foreleg paralysis.	Absent (N)	Osteosarcoma (N)
12	8	M	Irish Setter	Radius (dist. 1/3-left.)	2-3 mo.; lameness and swelling.	Negative chest x ray.	Osteosarcoma (R)
13	8	F (Sp.)	German Shepherd	Radius (dist. 1/3-left.)	1 mo.; lameness; swelling.	Lungs (R)	Osteosarcoma (R)
14	6	F	Irish Setter	Radius (dist. 1/3-rt.)	2 mo.; lameness, swelling.	Chest x ray not taken.	Osteosarcoma (R)
15	—	—	Large Breed	Radius (dist. 1/3-rt.)	Lameness and swelling.	Negative chest x ray.	Osteosarcoma (R)
16	8	F	Ches. Retriever	Radius (dist. 1/3-rt.)	4 mo.; lameness, swelling.	Chest x ray not taken.	Osteosarcoma (R)
17	5	F (Sp.)	Dane	Radius (dist. 1/3-left.)	1-2 mo.; lameness, swelling.	Chest x ray not satisfactory.	Osteosarcoma (R)
18	5	M	Dane	Radius (dist. 1/3-left.)	1 mo.; sudden swelling, lameness.	Lungs, liver, kidneys, and jejunum 5 wk. after amputation.	Osteosarcoma (S & N)
19	6	M	Saint Bernard	Radius (dist. 1/3-rt.)	2 mo.; lameness, swelling.	Absent (N)	Osteosarcoma (N)
20	8	F	Saint Bernard	Radius (dist. 1/3-rt.)	Lameness, swelling.	Chest x ray not taken.	Osteosarcoma (R)
21	—	—	Dane	Radius (dist. 1/3-left.)	Lameness, swelling.	Chest x ray not taken.	Osteosarcoma (R)
22	4	F	Saint Bernard	Radius (dist. 1/3-left.)	1 mo.; sudden swelling, lameness.	Lungs (N)	Osteosarcoma (N)
23	11	F	Dane	Radius (dist. 1/3)	Lameness, swelling.	Absent (N)	Osteosarcoma (N)
24	6	F	Dane	Radius (dist. 1/3)	2 mo.; lameness, rapid swelling to size of football.	Lungs (N <sup>1</sup> )	Osteosarcoma (R & N <sup>1</sup> )
25	8	F	Irish Setter	Radius (dist. 1/3-left.)	Lameness; gradual & then rapid swelling & edema.	Negative chest x ray.	Osteosarcoma (B)
26	9	F (Sp.)	Mixed Setter	Radius (dist. 1/3-rt.)	2 mo.; lameness, swelling.	Negative chest x ray prior to amputation.	Osteosarcoma (S)
27	5	M	Dane	Radius (dist. 1/3)	2 wk.; lameness, swelling.	Chest x ray not taken.	Osteosarcoma (R)
28	5	F	Boxer	Ulna (mid.-left.)	3 wk.; lameness, swelling.	Lungs 3.5 mo. after amputation.	Osteosarcoma (S & N)
29	9	M	Irish Setter	Ulna (dist. 1/3)	4 yr. (?) ulnar swelling noted; 1-2 mo. dyspnea, sternal swelling.	Lungs, sternum, & phalanx. (R)	Osteosarcoma (R)
30	8	F	Ches. Retriever	Ulna (dist. 1/3)	Lameness, bony swelling.	Negative chest x ray.	Osteosarcoma (R)

(Continued on next page)

TABLE 1 (Continued)—Primary Bone Tumors in Dogs

Case	Age (yr.)	Sex	Breed	Site	Clinical signs	Metastases	Diagnosis
31	12-14	M	Mixed Breed (35 lb.)	Femur (dist. 1/2-rt.)	Lameness, large bony mass.	Lungs (R & N)	Osteosarcoma (N)
32	8	F (Sp.)	Labrador Retriever	Femur (dist. 1/2-rt.)	4-5 mo.; lameness, huge bony mass.	Absent (N)	Osteosarcoma (N)
33	4	F (Sp.)	Boxer	Femur (prox. 1/2-rt.)	3-4 mo.; lameness, swelling. T.103.6.	Chest x ray not taken.	Osteosarcoma (S)
34	4-5	F	Pointer	Femur (neck-left.)	8 mo.; intermittent lameness, muscle atrophy, no swelling.	Chest x rays negative 3 mo. after lesion incompletely resected.	Fibrosarcoma (S)
35	8	F	Boxer	Femur (mid.-rt.)	1 wk.; lameness.	Absent (N)	Osteosarcoma (N)
36	3	F	Shetland Collie	Tibia (prox. 1/2-rt.)	5-6 mo.; lameness, gradual swelling.	Chest x ray negative before surgery.	Fibrosarcoma (S) (periosteal origin)
37	7	F (Sp.)	Boxer	Tibia (dist. 1/3-rt.)	3 mo.; heat, swelling, lameness.	Subcutaneous (left flank) & mesentery.	Hemangiosarcoma (S & N)
38	9	M	Dane	Tibia (dist. 1/2-rt.)	3 mo.; lameness, swelling.	Chest x ray not taken.	Osteosarcoma (R)
39	10	F	Dane	Tibia (dist. 1/2-rt.)	2 wk.; lameness swelling.	Chest x ray not taken.	Osteosarcoma (R)
40	7	M	Afghan	Tibia (dist. 1/3-rt.)	1 wk.; sudden swelling, lameness.	Dyspnea, cough, weight loss-6 wk. after biopsy (probably lung metastases).	Osteosarcoma (B)
41	6	M	Boxer	Tibia (mid.-left.)	None present.	Lungs (R)	Osteosarcoma (R)
42	5	F (Sp.)	Saint Bernard	Tibia (dist. 2/3-left.)	4 mo.; progressive lameness, bony swelling.	Chest x ray not taken.	Osteosarcoma (R)
43	9	F	Boxer	Tibia (prox. 1/3-rt.)	Lameness, swelling.	Chest x ray negative.	Osteosarcoma (R)
44	2	M	Irish Setter	Tibia (prox. 1/3-left.)	1 mo.; lameness, slight swelling.	Chest x ray negative.	Osteosarcoma (B)
45	2	M	Boxer	Tibia (dist. 1/3)	1-2 mo.; lameness, rapid swelling.	Chest x ray not taken.	Osteosarcoma (S)
46	7	M	Boxer	Tibia (prox. 1/3-left.)	6 wk.; lameness, slight swelling.	Positive chest x ray 7 mo. after amputation.	Osteosarcoma (S)
47	1.5	M	Boxer	Fibula (dist. 1/3-left.)	1 mo.; lameness, swelling, T. 103.5.	Negative chest x ray prior to biopsy.	Chondrosarcoma (B)
48	1	F (Sp.)	Collie	Metatarsal 4 (mid)	Swelling noted when pup bought at 3 mo. of age; gradual enlargement.	Negative chest x ray, dog asymptomatic 2 yr. later.	Hamartoma (R)
49	7	F	French Poodle	Metatarsal 4 (dist.-rt.)	3 mo.; pain, lameness, swelling.	10-11 mo. after amputation developed clinical signs of generalized metastases.	Osteosarcoma (S)
50	10	M	Hound	Metatarsals (prox.-left.)	5 mo. previous kicked by horse followed by progressive swelling.	Negative chest x ray prior to amputation; no post-surg. follow-up.	Osteosarcoma (R)
51	7	M	Doberman	Rib 9 (costochondral-left.)	3 mo.; gradual bony swelling.	Lungs, seen at surgical exploration.	Osteosarcoma (S)
52	4	F (Sp.)	Boxer	Rib 13 (dist.-rt.)	8 mo.; gradual bony swelling.	Negative chest x ray when recurrent tumor removed 4 yr. after first operation.	Chondrosarcoma (S)
53	7	M	Mixed breed (25 lb.)	Rib 9 (costochondral-left)	1-2 mo.; mass on rib cage, dyspnea.	Lungs and mediastinal lymph node; extension into liver, pericardium, pleura, & diaphragm.	Osteosarcoma (N)
54	1.5	M	Dalmatian	Ribs 10-12 (costochondral-left.)	2 wk.; rapid weight loss, dyspnea, and rib mass.	Lungs and sternal lymph node.	Osteosarcoma (N)

(Continued on next page)

TABLE 1 (continued)—Primary Bone Tumors in Dogs

Case	Age (yr.)	Sex	Breed	Site	Clinical signs	Metastases	Diagnosis
55	5	M	Springer Spaniel	Rib 4 (costochondral-rt.)	None.	Negative chest x ray prior to rib resection.	Chondrosarcoma (S)
56	2	F	Boxer	Rib 5 (costochondral-rt.)	6 wk.; rapid swelling, pain, and fever of 104.3.	Absent (N)	Osteosarcoma (S & N <sup>1</sup> )
57	5	M	Boxer	Sternebra 5.	3 wk.; dyspnea, sternal pain; hit by car 2.5 mo. before.	Absent (N)	Osteosarcoma (N)
58	6	M	Boxer	Ischium (left.)	2 wk.; lameness in left hindleg.	Absent (N)	Chondrosarcoma (N)
59	10	F	Boxer	Ilium (left.)	9 mo.; lameness & huge swelling.	Absent (N)	Mesenchymoma (N)
60	5	F	Boxer	Pubis (left.)	2 wk.; swelling & lameness.	Absent (N)	Chondrosarcoma (N)
61	8	F (Sp.)	Boxer	Parietal (left.)	2 mo.; rapid swelling.	Absent (N)	Osteosarcoma (N)
62	8	F	Dalmatian	Parietal and post. frontal.	9 mo.; gradual swelling.	Negative chest x ray	Osteosarcoma (B)
63	6	F	Boxer	Occipital.	7 mo.; gradual swelling.	Lungs (N)	Osteosarcoma (N)
64	9	M	German Shepherd	Squamous temporal.	-----	Chest x ray not taken.	Osteosarcoma (R)
65	6	F	Airedale	Turbinates (left.)	1 day; severe epistaxis.	Absent (N)	Chondrosarcoma (N)
66	9	M	Hound	Turbinates	2-4 wk.; epistaxis & swelling.	Absent (N)	Chondrosarcoma (N)
67	10	M	Labrador Retriever	Turbinates (left.) & both frontal sinuses.	1 mo.; epistaxis & swelling.	Absent (N)	Osteosarcoma (N)
68	8	M	Collie	Turbinates (left.)	5 mo.; epistaxis & huge mass.	Absent (N)	Osteosarcoma (N)
69	---	---	Large breed	Turbinates	Epistaxis.	Chest x ray not taken.	Osteosarcoma (R)
70	7	M	Collie	Maxilla (rt.)	3 mo.; swelling.	Chest x ray not taken.	Osteosarcoma (R)
71	10	F	Boxer	Mandible (post-left).	Swelling.	Chest x ray not taken.	Osteosarcoma (R)
72	4	F	Dane	Mandible (post-left).	3 mo.; anorexia.	Chest x ray not taken.	Osteosarcoma (R)
73	4	F	English Setter	Mandible (ant-left).	Progressive bony swelling.	Absent (N)	Osteosarcoma (N)
74	9	F	Greyhound	Cervical vertebra 5.	5 wk.; bilateral paralysis of forelegs, then hindlegs; cervical swelling.	Absent (N)	Osteosarcoma (N)
75	5	M	Dalmatian	Lumbar vertebrae 5, 6, 7.	6 mo.; gradual bony swelling; intermittent hindleg lameness.	Chest x ray not taken.	Chondrosarcoma (B)

N—necropsy plus histopathological examination; N<sup>1</sup>—necropsy without histopathological examination; R—radiological; B—surgical biopsy; S—histological examination following radical surgical removal.

tumor and sudden subcutaneous extravasation of blood or pathological fractures (cases 12, 13, 18, 23), resulting in hot painful swellings. These were often misdiagnosed as sprains, hematomas, or acute arthritis until the gradual or rapid enlargement of the lesion made it apparent that a bone sarcoma was present. The owner often believed that the injury was the

cause of the tumor. Of the 16 cases, 9 occurred in the giant breeds.

#### ULNA

One of the three tumors affecting the ulna (case 28) presented a rather typical radiological appearance of osteosarcoma (severe cortical lysis, sunbursting, and marked soft tissue swelling) but was un-

usual in its site of origin, the upper part of the middle third of the ulna.

Following biopsy and mid-humeral amputation, the dog appeared normal for three months and then showed malaise and painful swellings of both hindlimbs. Two days later, the front leg became similarly swollen. Her appetite became poor, she began to vomit, and a continuous fever developed which did not respond to aureomycin. She moved reluctantly, had severe arthralgia, and the skin temperature of her legs averaged 0.5 degree above the rectal temperature. Typical changes of hypertrophic osteoarthropathy were seen on radiographs, and several metastatic lesions were seen in the lungs.

The leukocyte count was 30,000 per cubic millimeter on the day of admission and rose to 46,000/cmm. three days later. The urine contained many erythrocytes, leukocytes, and granular casts. The dog then developed decubital ulcers, dyspnea, bloody diarrhea, and severe depression.

At necropsy, after euthanasia, a large flat mass 10 by 10 by 6 cm. was found adherent to the pericardium and the right cardiac lobe. On cut section, it was gray with many cystic areas which contained a green-gray mucoid material. Other metastatic nodules, 3 to 20 mm. in diameter, were present in the left cardiac lobe, the intermediate lobe, and both diaphragmatic lobes.

There was also a severe gastroenteritis and marked nephrosis. The extremities showed the characteristic changes of osteoarthropathy.

#### FEMUR

There were five tumors affecting the femur.

In dog 32, a tremendous lytic tumor had caused a pathological fracture with marked displacement of the fragments. There was extensive elevation of the periosteum with much periosteal new bone formation (this periosteal abutment formation is usually referred to as Codman's triangle), marked sunbursting, and widespread invasion of surrounding muscles.

The radiological appearance of the femur of dog 33 was unusual. In the mid-shaft region, there was a lytic area with elevation of the thickened periosteum over 7.0 cm. of the diaphysis. Proximal to this, the cortex apparently was normal for 2.5

cm., then there was a second osteolytic-osteoblastic tumor which had almost completely destroyed the femoral head, neck, and trochanter major. This radiograph shows an intramedullary spread of the lesion which caused minimal radiological change in one small intermediate area, thus simulating two separate sarcomas. The biopsy diagnosis was osteosarcoma.



Fig. 1—Lateral radiograph of a reticulum cell sarcoma of the proximal extremity of the humerus in a 1-year-old English Setter (case 8). There is almost complete destruction of the humeral head, including most of the articular cartilage.

In dog 34, there had been some pain and intermittent lameness associated with gluteal muscle atrophy for eight months. No bony swelling could be palpated. Radiographically, the femoral neck was expanded and contained radiolucent areas which extended from the femoral head to a point just distal to the trochanter major. There was no periosteal reaction or soft tissue swelling (fig. 2).

A radiograph taken three months later revealed severe cortical lysis with pathological fracture and a crumbling of the femoral head (fig. 3). The proximal portion of the femur was resected and a prosthesis





Fig. 2—Ventrodorsal radiograph of a fibrosarcoma of the femoral neck in a 4-year-old female Pointer (case 34). Notice the many radiolucent areas and the expansion of the femoral neck. Periosteal reaction is absent.

Fig. 3—Ventrodorsal radiograph (case 34) taken three months after the one shown in figure 2. Notice the increased osteolysis with pathological fracture of the neck and crumbling of the femoral head.

was applied. Histological studies suggested a malignant tumor of fibrous origin. The immediate postoperative radiograph revealed a small area of tumor at the junction of the prosthesis and the femur.

During the following months, a hard swelling gradually developed in the area of the prosthesis. The dog used the leg for a few months, but then lameness gradually developed. Radiographs indicated extensive bony proliferation around the prosthesis. Following euthanasia seven months after surgery, a huge mass of spongy bone was found completely obliterating the hip joint.

#### TIBIA

There were nine tumors of the tibia. In dog 36, the proximal half of the tibia, with the exception of the articular cartilage, was completely destroyed. The huge surrounding soft tissue mass, containing many irregular calcific densities, extended just proximal to the femoral condyles (fig. 4). A mid-thigh amputation was per-

formed. Histologically, this lesion was a typical fibrosarcoma which appeared to be of periosteal origin. Eighteen months later, the dog was reported to be in good health.

In dog 37, the tumor had destroyed the distal third of the tibia. This area was surrounded by a large, boggy, soft tissue swelling. Osteolytic changes also extended up to the proximal epiphyseal line. There was no periosteal reaction (fig. 5). The serum alkaline phosphatase was elevated (8.7 Bodansky units). A radiograph of the thorax showed no metastases, and a mid-thigh amputation was performed. A longitudinal section of the tibia revealed a hemorrhagic tumor mass which filled the medullary cavity and, distally, extended widely into the soft tissues (fig. 6). The histological diagnosis was hemangiosarcoma.

Three months after amputation, a radiograph showed the thorax to be normal. However, a rapidly growing subcutaneous



nodule which had appeared two weeks previously in the left flank was enlarging rapidly. During the following two weeks, the dog became progressively weaker and finally was unable to get up. Concomitantly the flank lesion had grown tremendously and widely infiltrated the abdominal wall. Just prior to euthanasia, three and one half months after amputation, the hemoglobin level was only 60 per cent of normal.

Necropsy revealed a blood-filled tumor 10 cm. in diameter in the left flank area which extended into the parietal peritoneum. The mesentery was studded with small red nodules. All the other internal organs were normal. The flank lesion apparently was metastatic as it was not noticed until several months after the amputation. The mesenteric nodules undoubtedly represented implantation metastases from the flank tumor.

In case 38, the dog incurred a fracture while running in the garden. It was diagnosed as a traumatic fracture of the tibia and a plaster of paris cast was applied. Three weeks later, the pressure from the rapidly growing tumor had almost split open the cast. The radiograph revealed an extensive lytic tumor of the distal tibia with a pathological fracture. The tumor had infiltrated the distal portion of the fibula which was also fractured.

The radiograph of the tibia of dog 39 was characterized by multiple cortical erosions and prominent sunbursting for a distance of 12 cm. along the diaphysis. This sarcoma appeared to originate at the junction of the distal and middle thirds of the tibia.

One year prior to the admission of dog 40 to the clinic, the animal was struck by a car and sustained a comminuted fracture of the distal third of the right tibia. Radiographically, the bone quality seem normal. After intramedullary fixation, there was gradual healing during the next two months. This healing process was followed radiographically. The dog did well for ten months; then, during one week, it developed a huge fluctuating blood-filled swelling over the site of the original fracture.

Radiographs indicated an expanding lytic mass in the posterior portion of the distal extremity of the tibia at the site of the old fracture. The anterior part of the lesion showed many bone spicules radiating

into the huge (13 by 9 cm.) soft tissue mass. The lesion had begun to invade the tibio-tarsal joint. The intramedullary pin was present in the center of the tumor mass (fig. 7). The blood count was normal but the alkaline phosphatase was elevated to 9.8 Bodansky units. A biopsy confirmed the clinical diagnosis of osteosarcoma.

Six weeks later, the dog had a cough, and showed dyspnea, anorexia, and weight loss. There undoubtedly were pulmonary metastases but a necropsy was not performed.

A tumor detected in a Boxer (case 41), which had multiple mastocytomas, was the only sarcoma to arise in the midshaft of a bone. This lesion on the anterior aspect of the diaphysis of the tibia showed marked sunbursting over a distance of 4 cm. The underlying cortex seemed unaffected and there was only slight soft tissue swelling.



Fig. 4—Lateral radiograph of a fibrosarcoma of the proximal tibia in a 3-year-old female Shetland Collie (case 36). The proximal half of the tibia, with the exception of the proximal epiphysis, has been destroyed. In its place is a huge soft tissue mass containing irregular calcific densities. The ulna is intact.

This tumor appeared to be of periosteal origin, unlike the other osteosarcomas which arose more centrally and involved



Fig. 5—Dorsoventral radiograph of a hemangiosarcoma of the tibia in an 8-year-old female Boxer (case 37). The distal tibia has been completely destroyed and extensive lytic changes involve the entire diaphysis. Notice the huge soft tissue mass around the origin of the tumor at the distal tibia.

Fig. 6—Gross specimen (case 37) after longitudinal section of the tibia. The tumor is highly vascular and extends throughout the medullary cavity. Distally, the tumor has broken through the cortex into the soft tissues.

the periosteum later. Radiographs showed that the lungs were diffusely infiltrated with dense osteoblastic metastases.

Radiographically, the tumor in dog 42 was osteoblastic and in some areas the cortico-periosteal layer was 2 cm. thick.

In dogs 44 and 45 there were small, primarily osteolytic tumors arising from the proximal lateral surface of the tibia. Histologically, both were diagnosed as fibroblastic varieties of osteosarcoma. Dog 45 was doing well six months after a mid-thigh amputation but, at seven months, was reluctant to walk and had difficulty getting up. All the limbs were thickened and sensitive when touched. Radiographs

revealed the typical changes of hypertrophic pulmonary osteoarthropathy and well-defined, rounded densities in the apical lung area, which probably represented metastatic osteosarcoma.

#### FIBULA

There was one tumor (case 47) of the fibula. Radiographically, the lesional area contained multiple calcific densities which replaced the distal portion of the fibula and widely involved the adjacent soft tissues. This was the only chondrosarcoma seen in a long bone. Radiographically, the lungs were negative for metastasis. One week after biopsy, there was an exacerbation of



Fig. 7—Lateral radiograph of an osteosarcoma of the distal extremity of the tibia in a 7-year-old male Afghan (case 40). The tumor developed one year after intramedullary pinning of a comminuted fracture of the same area. The posterior portion is osteolytic and the anterior portion is osteoblastic. Notice the huge soft tissue mass.

tumor growth and the dog was euthanized.

#### METATARSUS

The clinical and radiological features of case 48 were unique in this series. When this Collie was purchased at 3 months of age, a bony swelling was noticed in the metatarsal area. Lameness did not appear until nine months later. The main radiological finding was an irregular enlargement of the mid-shaft area of the fourth metatarsal. The cortical bone was thinned but periosteal reaction was absent (fig. 8). Surgical removal of the affected metatarsus and corresponding digit was advised but treatment was refused. Two years later, the dog was reported to be asymptomatic.



Fig. 8—Dorsoventral radiograph of a hamartoma of the fourth metatarsal bone in a 1-year-old female Collie (case 48). The diaphysis is irregularly enlarged and the cortical bone thinned. Notice the deformity of the adjacent metatarsal by the expanding lesion.

This lesion probably represented a hamartoma rather than a true neoplasm. A hamartoma is a tumor-like malformation arising from cells indigenous to the part but which (unlike a true neoplasm) stops growing when growth of the part ceases. This was the only benign bone lesion observed in this series.

In dog 49, the lesion was initially treated as arthritis. Radiographs revealed a de-

bony mass appearing between the eyes, a 7- to 10-cm. mass palpated in the region of the spleen, and a possible bone tumor noticed at the amputation stump suggested the development of generalized metastasis. Eleven months after surgery, euthanasia was performed without a necropsy.

The lesion in dog 50 occurred after it was kicked in the left hock by a horse and the resultant laceration was sutured. During the five months following the injury, this area progressively enlarged and lameness became more severe. Radiographically, an osteoblastic mass was seen involving the proximal portions of the metatarsals. There was radiation of bony spicules into the soft tissues with several centrally located osteolytic foci. The neoplasm was beginning to invade the distal row of tarsal bones (fig. 9). A mid-femoral amputation was performed.

#### RIBS

In 6 dogs the ribs were affected.

In dog 51, a hard painless mass had involved the left thoracic wall. Radiographs showed that an osteoblastic-osteolytic lesion had destroyed the costochondral junction of the affected rib and infiltrated the adjacent ribs. Many granular calcific densities were scattered throughout the 7.5- by 8.0-cm. lesion. No lesions were detected in the radiograph of the thorax but, on thoracotomy, the tumor was seen to be infiltrating part of the left portion of the diaphragm. Three ribs and the attached portion of the diaphragm were excised. Four or five small bony nodules were then noticed in the lobes of the left lung. Some of these nodules could be seen when the radiograph was re-examined.

Radiographically, the rib tumor in dog 52 contained mottled areas of calcific density and seemed well circumscribed; no lesions were seen in the thorax. The tumor and the attached rib was readily resected. The tumor was hard and round; on cut section it was gray, gritty, and lobulated. The histological diagnosis was chondrosarcoma of low grade malignancy.

Four years later, the dog was returned with a recurrent mass at the site of the original tumor. It had been present about six months and had shown gradual enlargement. The radiograph showed no thoracic lesions but the alkaline phosphatase was high (27.5 Bodansky units). The



Fig. 9—Dorsoventral radiograph of an osteosarcoma of the proximal portions of the metatarsals of a 10-year-old male hound (case 50). The lesion is osteoblastic except for a central sharply-defined osteolytic focus.

structive lesion of the fourth metatarsal bone associated with pathological fracture and marked sunbursting. Amputation was performed in the mid-femoral area. Ten months later, the dog developed an intermittent cough associated with choking spells and occasional emesis. An ulcerating

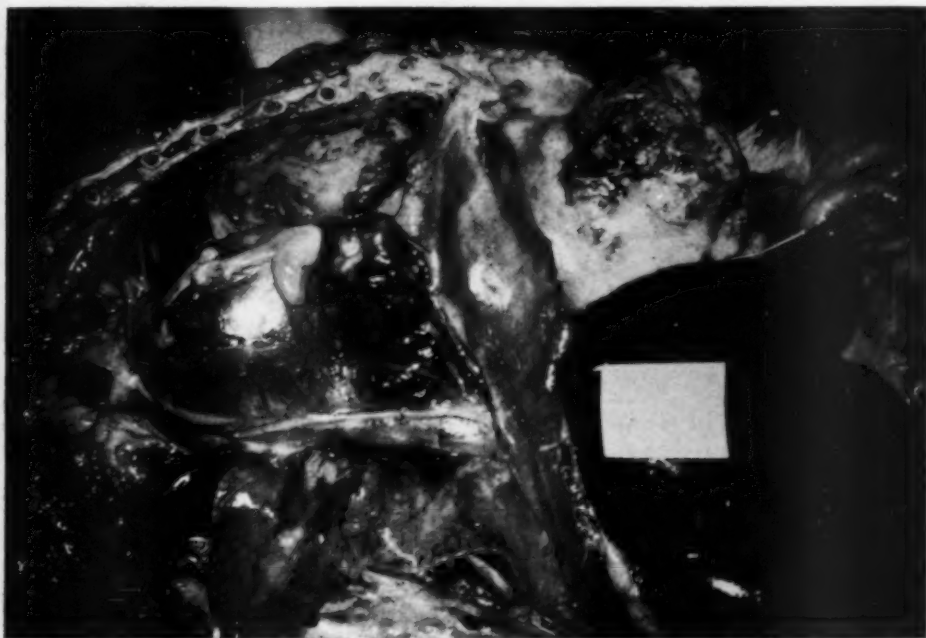


Fig. 10—Necropsy specimen of an osteosarcoma of the rib cage in a 7-year-old male mongrel Terrier (case 53). The diaphragm seen in the center of the picture divides the thoracic portion of the tumor (located just above the heart) from the abdominal portion (located just above the liver).

tumor (7.0 by 5.5 cm.) was encapsulated and easily removed. On cut section it was grayish white, gritty, and lobulated with foci of cystic degeneration.

Case 53 was a 25-lb. dog submitted for euthanasia. It had a diffuse, painful, bony mass involving much of the left thoracic wall. Dyspnea and listlessness were marked. Radiographically, a lytic zone was present at the costochondral junction of the ninth rib but a huge osteoblastic mass extended cranial to the seventh rib and caudad to the twelfth rib. At necropsy this huge bony mass (15 by 15 by 10 cm.) filled almost the entire left half of the thorax and was adherent to the pericardium, visceral pleural, diaphragm, and liver (fig. 10). The left pleural cavity contained some hemorrhagic fluid and the lungs were displaced cranially and dorsally. The right lung contained hard metastatic nodules and the left anterior mediastinal lymph node was 3.7 by 2.5 by 1.2 cm., hard, and white.

This case was unusual in several respects: the tumor occurred in a small breed dog; it involved a huge area of the

rib cage; and it showed lymph node metastasis.

In dog 54, a rapidly growing bony mass on the rib cage had been noticed for three weeks. The dog began to lose weight and became dyspneic. Radiographs showed an osteoblastic and infiltrative tumor of the ribs and many dense metastatic lesions in the lungs. At necropsy the rib tumor (8.5 by 9.0 by 8.0 cm.) was firm, granular, and gritty. A lobulated mass (4.5 cm.) involved the sternal lymph node. The numerous lung nodules (0.5 to 2.5 cm.) were brown, granular, and gritty.

The tumor in dog 55 was detected accidentally when the owner was combing the dog. It was a painless, bony enlargement (4 cm.) of the costochondral junction of the right fourth rib. Radiographically, it was a lytic, expansile tumor with a well-defined border; no intrathoracic lesions were seen. The resected tumor was small, nodular and, on cut surface, grayish white and cartilaginous. The prognosis seemed fairly good, as the tumor was detected before other clinical signs were apparent. Also, this tumor was quite small and had



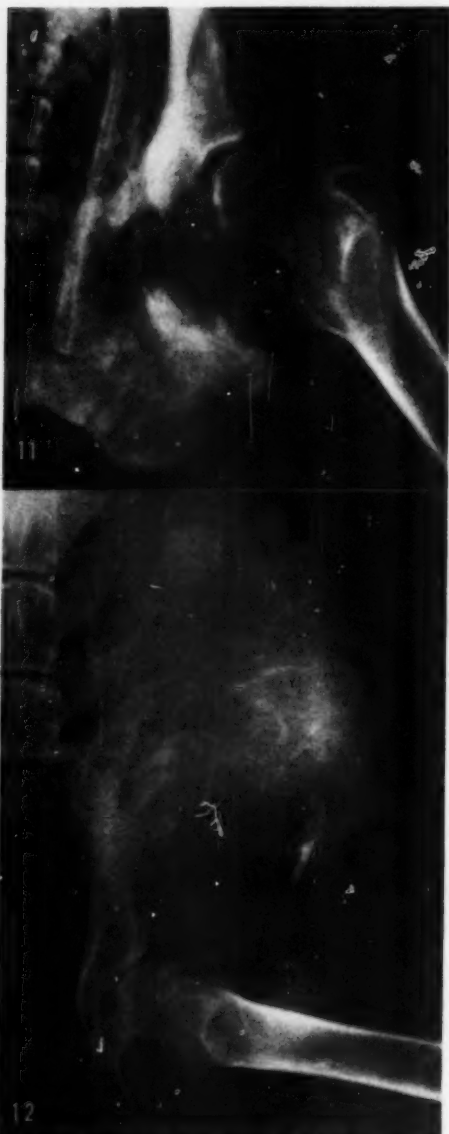


Fig. 11—Ventrodorsal radiograph of a chondrosarcoma of the ischium in a 6-year-old male Boxer (case 58). There is widespread destruction of the ischium and posterior portion of the acetabulum, with proliferative changes near the tuber ischium and medially into the obturator foramen. Congenital hip dysplasia is also present.

Fig. 12—Ventrodorsal radiograph of a mesenchymoma of the ilium in a 10-year-old female Boxer (case 59). Notice the huge soft tissue mass containing irregular wispy strands of calcific material. Congenital hip dysplasia is also present.

not infiltrated adjacent structures. Seven months later, the dog was reported to be doing well.

The tumor in dog 56 was osteoblastic and had invaded the fourth rib. The periosteum proximal to the tumor was greatly elevated by the underlying expanding tumor. This periosteal distension probably was the cause of the marked local pain and fever. Radiographically, the thorax was normal but exploratory thoracotomy revealed a huge bony mass involving the pericardial sac by fibrous adhesions. The fourth and fifth ribs and most of the pericardial sac were resected. The animal did well at home for the next month; then it showed evidence of severe pain in the region of the operative site. After euthanasia, necropsy revealed marked cardiac dilatation but no recurrence in the thoracic wall.

The average age of the 6 dogs with rib sarcomas was 4.3 years. The tendency for rib tumors to occur in young dogs has been previously observed.<sup>4,5</sup>

#### STERNUM

The only dog with a tumor arising from the sternum (case 57) had marked dyspnea of three weeks' duration. The dog appeared restless, tired easily, and showed pain when lying on his sternum. It had been injured when hit by an automobile two and one half months previously. Radiographically, there was opacification of the lower two thirds of the thoracic cavity. An osteolytic area was noticed in the fifth sternebra but was thought to be a result of the injury. A tentative diagnosis of diaphragmatic hernia associated with severe hydrothorax and possible liver strangulation was made.

After euthanasia, a huge, variegated, lobulated mass was found arising from the fifth sternebra, filling the lower half of the thorax, and markedly displacing the heart and trachea. The adjacent lobes of the lung were atelectatic and the pleural cavity contained 200 cc. of serosanguineous fluid. The tumor was grayish white and contained foci of hemorrhage and necrosis intermingled with many bone spicules.

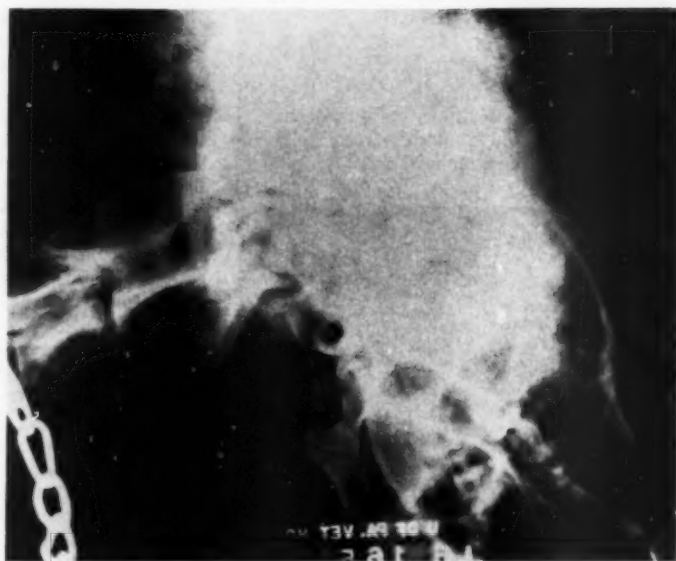
In retrospect, the sternal pain showed by the dog and the sternbral erosion seen on the radiographs were highly significant.

#### PELVIS

There were three tumors arising from the pelvic bones. The radiographs in case



Fig. 13—Lateral radiograph of a large osteosarcoma arising from the occipital region in a 6-year-old female Boxer (case 63). It is osteoblastic with multiple granular calcific densities visible peripherally.



58 showed a lytic tumor involving the posterior acetabulum and entire left pubic ramus with some irregular bony proliferation (fig. 11). At necropsy a bilobed mass (5 by 5 by 3 cm.) occupied the left ischial region and posteromedial portion of the acetabulum. Grossly, the tumor was lobulated and translucent with a cartilaginous consistency.

The tumor in dog 59 involved the shaft and wing of the ilium as well as the adjacent soft tissues. Radiographically, the lesional area contained many irregular, wispy strands of calcific material (fig. 12). Necropsy revealed a large, firm, dumbbell-shaped, heavily encapsulated mass which was approximately the size of a football. On cut surface it was extremely variegated with foci of hemorrhage, necrosis, and bony spicules. Histologically, this tumor was diagnosed as a mesenchymoma.<sup>12</sup>

Dog 60 had a bony swelling in the inguinal area which was firmly attached to the pelvis and proximomedial portion of the femur. The radiograph showed a large, well-circumscribed, soft tissue mass arising from the pubic ramus and the medial part of the acetabulum from which there was slight periosteal proliferation. Surgical exploration revealed a highly-vascularized firm mass which could not be completely excised and euthanasia was performed.

The tumor (8 by 6 by 6 cm.) was lobu-

lated, translucent, and of cartilaginous consistency. It arose from the acetabular branch of the left pubis and a third of its bulk extended to the right of the midline. It was attached to the proximal portion of the shaft of the left femur by dense fibrous adhesions.

#### CRANIUM

There were 4 dogs with tumors arising from the cranium. Radiographically, all the lesions were characterized by evenly distributed granular calcific densities. They had regular borders and seemed well-defined. The bone was usually eroded at the site of origin of the tumor. Radiographically, they did not resemble the osteosarcomas which developed at other sites. In dogs 61 and 62, attempts at surgical removal were unsuccessful. The tumor in dog 63 (fig. 13) became so large that the dog could hardly hold up its head. The skin of the forehead was drawn so tightly that the palpebral fissures were slitlike. Pulmonary metastases were present (fig. 14).

The gross appearance of these tumors was that of a crumbly firm mass that contained numerous calcareous nodules. In dog 61, the tumor caused a deep indentation of the posterior portion of the left occipital lobe of the cerebrum and slight compression of the dorsolateral portion of the cere-

bellum. Neurological manifestations were not present.

#### NASAL AREA

There were five tumors arising from the turbinates and one from the maxilla.

Almost all neoplasms arising in the

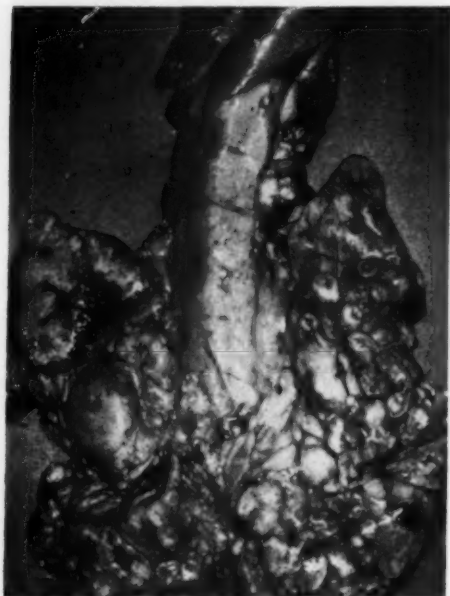


Fig. 14—Necropsy specimen of the lungs (case 63) showing numerous metastatic lesions.

turbinate region of the dog are malignant. In our clinic, the most common type seen is adenocarcinoma arising from the mucous glands of the nasal mucosa. Whatever the histological type, they are clinically similar. The earliest and most important sign is spontaneous unilateral epistaxis which may appear suddenly (case 65), or may follow a chronic mucoid discharge. The epistaxis, unilateral at first, may become bilateral if the tumor extends to the opposite side. Swelling, deformity, and destruction of the adjacent bones occur late in the course of the disease.

A diagnosis can usually be made from a dorsoventral radiograph of the head. The affected area is opaque in contrast to the normal air-filled turbinate area. The nasal septum is often displaced, eroded, or perforated by the lesion. In case of doubt, the

head can be radiographed again in three or four weeks, at which time the changes will be more advanced if a malignant neoplasm is present.

In advanced cases of bone sarcomas, a lateral radiograph may show destruction and displacement of the overlying cortical bone and a "sunbursting" of the tumor into the surrounding soft tissues (case 68). This tumor also caused marked ventral displacement of the soft palate. In dog 67, the osteosarcoma also involved both frontal sinuses and caused proptosis of the left eye.

In dog 70, there was destruction of most of the right maxilla with a soft tissue mass containing many fine calcific densities. The alveolar bone in the region of the first three premolars was largely destroyed, resulting in faulty tooth alignment. The turbinate region appeared normal.

These tumors, probably because they are encased by a bony framework, seldom metastasize. Many of these cases are misdiagnosed as sinusitis, rhinitis, trauma, and an abscess of the fourth upper cheek (carnassial) tooth. Biopsy material can be obtained by trephination or, in some cases, by entering the affected area through a neighboring alveolus. These procedures may result in considerable hemorrhage and postsurgical discomfort.

#### MANDIBLE

There were three tumors arising from the mandible.

The radiographs of cases 71 and 72 were characterized by extensive lytic changes with a moderate amount of bony proliferation and the affected bone in dog 72 had a moth-eaten appearance. The latter dog was only able to open its mouth 1 inch and had to be fed liquids. There was marked atrophy of the temporal and masseter muscles. Many radiating bony spicules were present, particularly at the caudal end of the tumor in the region of the angle and the coronoid process. In dog 73, there was a dense osteoblastic lesion with typical "sunbursting" (fig. 15).

Primary bone tumors of the mandible of the dog are uncommon. However, many soft tissue malignancies of the gingiva, particularly epidermoid carcinomas, commonly invade and destroy the adjacent mandible and may simulate osteosarcomas. These can usually be differentiated by the

history coupled with an examination of the mouth, regional lymph nodes, and lungs.

#### VERTEBRA

There were two tumors of the vertebrae.

Dog 74 first manifested anorexia, generalized muscular tremors, and cervical pain. In the following month, knuckling of the right foreleg was followed by a bilateral foreleg paralysis. Two weeks later, prostration, emaciation, and the palpation of a large bony mass in the lower cervical region indicated a malignant vertebral tumor.

Radiographically, the lesion arose from the fifth cervical vertebra and extended into the fourth. The affected bone contained many lytic foci. The tumor caused great distortion of the vertebrae and extended irregularly into the surrounding muscles. A myelogram revealed obstruction to the caudad flow of radiopaque dye at the cranial part of the fourth cervical vertebra (fig. 16). At necropsy a large, irregular, grayish, bony mass completely replaced the fifth cervical vertebra and the caudal part of the fourth. There was marked compression of the spinal cord.

A huge bony mass had gradually developed in the lumbosacral region of dog 75. Except for some intermittent lameness, the dog had seemed normal. Radiographically, the tumor was characterized by a huge soft tissue mass containing numerous, irregularly scattered, calcific densities. This chondrosarcoma arose in the region of the last three lumbar vertebrae and infiltrated the cranial part of the sacrum.

#### SERUM ALKALINE PHOSPHATASE

This enzyme, which has optimal activity at pH 9.4, is found in bone and cartilage and has the ability to hydrolyze monesters of phosphoric acid.<sup>8</sup> Osteoclasts have a high phosphatase content and this enzyme may play a role in bone resorption. Although the early literature definitely related phosphatase to calcification, the exact function of this enzyme in the metabolism of bone is still not entirely clear.<sup>8</sup>

A study of osteosarcoma in man<sup>13</sup> revealed that the most heavily calcified portions of the tumors contained less alkaline phosphatase than the lytic areas. Thus the lytic zones appeared to contain the more actively metabolizing tissue. When bone destruction occurs, there is usually reac-



Fig. 15—Dorsoventral radiograph of an osteosarcoma of the mandible in a 4-year-old English Setter (case 73). The tumor is osteoblastic and shows marked sunbursting.

tive new bone formation by the adjacent normal bone. This reactive bone, which is high in osteoblastic activity, may partly account for the excess phosphatase levels in the serum. It is also possible that the tumor giant cells are high in alkaline phosphatase.

The normal values of serum alkaline phosphatase in dogs of various breeds and ages has not been definitely determined. The previously reported values<sup>2,3</sup> were apparently based on small dogs in the younger age groups. The normal phosphatase values in older large dogs would probably be lower, ranging up to 2 or 3 Bodansky units. A high phosphatase level was noticed in a low grade recurrent chondrosarcoma (table 2, case 52). One author reported,<sup>11</sup> in a histochemical study of bone and cartilage formation in fetal rats, that phosphatase activity in cartilage was limited to cells in the hypertrophic stage. In general, the phosphatase was elevated in the larger primarily lytic tumors.

In some cases, a quantitative determination of this enzyme may aid in the differential diagnosis of a benign from a

TABLE 2—Serum Alkaline Phosphatase Values in Canine Bone Tumors

Case	Tumor	Site	Alkaline phosphatase Bodansky units	Remarks
10	Osteosarcoma	Humerus	14.7	Primarily a lytic tumor.
11	Osteosarcoma	Humerus	25.7	A rapidly-growing, primarily lytic mass which infiltrated brachial plexus.
18	Osteosarcoma	Radius	9.0	A large tumor with areas of lysis and bone formation; 4 days after amputation, the serum phosphatase was 7.5 Bodansky units.
19	Osteosarcoma	Radius	2.0	A slow-growing tumor with large lytic zones and considerable osteoblastic activity.
22	Osteosarcoma	Radius	2.7	Tumor primarily osteoblastic.
24	Osteosarcoma	Radius	7.3	Both lytic and blastic; 6 weeks later, tumor reached football-sized mass.
25	Osteosarcoma	Radius	39.6	Both lytic and blastic; 1 week after this high value obtained, tumor grew so rapidly that euthanasia performed.
26	Osteosarcoma	Radius	13.0	Osteolytic lesion with marked sunbursting.
35	Osteosarcoma	Femur	3.4	A small lytic tumor with marked periosteal new bone formation.
37	Hemangiosarcoma	Tibia	8.7	A rapidly-growing tumor which was highly lytic and involved the entire tibia.
40	Osteosarcoma	Tibia	9.8	A rapidly-growing tumor with large lytic zones and tremendous soft tissue swelling.
45	Osteosarcoma	Tibia	3.4	A slow-growing, small, mostly lytic lesion causing no enlargement of the bone.
52	Chondrosarcoma	Rib	27.5	Slow-growing recurrent tumor which was easily excised. Lesion had cystic center and cartilaginous periphery.
55	Chondrosarcoma	Rib	2.7	Small primarily lytic tumor detected before any clinical symptoms appeared.
58	Chondrosarcoma	Ischium	4.0	A highly lytic tumor.
60	Chondrosarcoma	Pubis	8.0	A large mass containing many cartilaginous foci.



Fig. 16—Lateral radiograph of an osteosarcoma of the fifth cervical vertebra in a 9-year-old female Greyhound (case 74). Notice the patchy foci of bone destruction combined with irregular areas of bony proliferation extending to the fourth vertebra. A column of radiopaque dye injected into the cisterna magna was blocked at the level of the fourth vertebra.

malignant lesion. One must be sure, however, that there are no other extraneous factors present, such as biliary obstruction (phosphatase is excreted through the biliary tree) which would lead to a high serum phosphatase level. A high postoperative level strongly indicates the presence of residual disease. For example, in dog 18 the serum phosphatase was 9 Bodansky units preoperatively and 7.5 Bodansky units four days postoperatively. Five weeks postoperatively, this dog became moribund. After euthanasia, necropsy revealed widespread metastases.

#### RADIOLOGICAL EXAMINATION

Fluoroscopic examination is useless in the diagnosis of bone tumors, and radiographic studies should always be carried out. The main radiological findings in a primary bone malignancy<sup>7</sup> are: (1) early and extensive irregular bone destruction; (2) absence of a clearly defined line between the neoplastic and the normal bone; (3) early rupture of the cortex; and (4) extensive invasion of the surrounding soft tissues.

Most osteosarcomas are characterized by a mixture of lytic and blastic changes and these vary in degree. Pathological fracture

is often seen in the more lytic tumors. In many cases, the so-called "sunbursting" is seen. This is caused by many spicules of tumor bone which radiate into soft tissues perpendicular to the long axis of the bone.

Another diagnostic sign of malignant bone tumor is Codman's triangle (fig. 17) which is present in a small proportion of all the cases. This triangle of periosteal new bone formation is a reaction to the elevation of the periosteum by the advancing malignant tumor.

A recent study of bone tumors<sup>12</sup> revealed that the amount of calcium in osteosarcomas in man is 5 to 20 per cent of that of normal bone. The predominant change produced by most bone sarcomas, radiologically, is osteolysis, except in the slowly growing "sclerosing" type (case 42). Much of the proliferative change is periosteal new bone formation, which is stimulated by the tumor as it distends the periosteum. This periosteal reaction may be an effort to contain the lesion in a bony covering and to give added rigidity to the affected bone. Once the tumor breaks through the periosteum, rapid growth into the soft tissues and adjacent veins occurs.

A radiograph of the thorax should always be taken to try to rule out pulmonary metastases prior to surgical intervention. If there is any doubt that a malignant bone neoplasm is present after the clinical and radiological examinations are completed, a second set of radiographs should be taken in two or three weeks. These usually reveal progressive osteolytic and osteoblastic changes in the affected bone which leave little doubt as to the true identity of the lesion.

#### SURGICAL TREATMENT

The main cause of death following surgical treatment is hematogenous metastases. Malignant cells are characterized by their lack of adhesiveness and thus become readily detached from one another. The handling of the tumor during the operation results in dislodgment of tumor cells into adjacent veins and their embolization to the lungs and other organs. A tourniquet should be applied proximal to the tumor after the dog is anesthetized and before the tumor area is prepared for surgery (one was employed in cases 26 and 45). Use of the tourniquet should improve the results of surgical management.



Fig. 17—Dorsoventral radiograph of an osteosarcoma of the distal portion of the radius in an 8-year-old female Irish Setter (case 26). There are many osteolytic areas in the medullary region. Notice the distinct Codman's triangle (arrow) produced by the elevation of the periosteum by the advancing tumor. Proliferative changes into the soft tissue mass are also present.

Biopsy is a highly dangerous procedure, as it may result in dissemination of tumor cells into the blood stream with early fatal metastases (case 40) or cause exacerbation of growth locally (case 47). The great bulk of these bone lesions can be readily diagnosed by a correlation of the clinical and radiographic findings. Thus biopsy is not



only unnecessary in most cases but may cause earlier death of the animal. In a few questionable cases, however, biopsy is needed to clarify the diagnosis.

Osteosarcoma is a highly malignant tumor and complete removal of the involved bone is mandatory. These tumors often extend along the medullary canal and radiographic examinations may not reveal the exact area of tumor involvement. Resections through the affected bone were performed in cases 34 and 44 and recurrence developed in both dogs. The shortest postoperative survival was five weeks (case 18) and the longest was 11 months (case 36).

The chance of cure or prolonged survival in the 2 dogs with rib chondrosarcomas seems much better. In case 47, recurrence was probably due to implantation of tumor cells at the time of the first operation. Tumor cells are infective to the host animal. In man, chondrosarcoma is notorious for its ability to recur by implantation<sup>6</sup> and recurrences are not uncommon even after five years. This experience seems to closely parallel the behavior of the chondrosarcoma in this dog.

Prolonged survival and probable cure was obtained in 1 dog (case 36) with a fibrosarcoma of the tibia.

#### DISCUSSION

Primary bone tumors affect large breed dogs almost exclusively. The Great Dane seems to have a tremendous predisposition to osteosarcomas of the long bones. Even though the Boxer predominated slightly in this series, one must consider the normal population of these dogs in the area of the study. National figures of the American Kennel Club<sup>1</sup> indicate that the Boxer is 15 times more common than the Great Dane or Irish Setter and 30 times more common than the St. Bernard. In the Philadelphia area, there is probably a far greater number of Boxers proportionally than these national figures indicate. Thus, while the Boxer is the most commonly affected breed, the data in this series indicate that the Great Dane, St. Bernard, and Irish Setter have a marked predilection for the development of bone sarcomas.

The cause of these bone tumors is still an enigma. It is doubtful that major trauma plays a role in the cause of these tumors but, in our series, the forelegs

(which bear about 10 per cent more weight than the hindlegs) were affected almost twice as often as the hindlegs. In man, by far the most common site for osteosarcoma is the knee joint, particularly the distal third of the femur.

#### SUMMARY

Of the osteosarcomas seen in 61 dogs, 29 were in bones of the foreleg and 15 in those of the hindleg. The bones listed in order of frequency of involvement are: radius—16, humerus—9, tibia—9, ribs—4, cranium—4, femur—4, ulna—3, turbinates—3, mandible—3, metatarsals—2, scapula—1, maxilla—1, sternbra—1, cervical vertebra—1.

The dogs ranged in age from 1 to 12 years with 72 per cent being from 5 to 9 years old, and the average age being 6.9 years. There were 30 females and 25 males.

The breed distribution was: Boxer—17, Dane—11, Irish Setter—6, Collie and St. Bernard—4 each, German Shepherd, Dalmatian, Labrador Retriever, Chesapeake Bay Retriever, unidentified large breed and mongrel Terrier—2 each, English Setter, Doberman Pinscher, Greyhound, Golden Retriever, Hound, French Poodle (Standard), and Afghan—1 each.

Lung metastases were observed in 17 (38%) of 45 cases. In 4 of these, the metastatic lesions were detected following surgery.

Seven cases of chondrosarcoma arose from flat bones (ribs—2, turbinates—2, ischium, pubis, and lumbar vertebra—1 each), and 1 in a long bone (fibula). These dogs ranged in age from 1 to 9 years with 75 per cent being from 4 to 6 years old and the average age being 5.1 years. The breed distribution was: Boxer—4, and Airedale, Hound, Springer Spaniel, and Dalmatian—1 each. None of the tumors metastasized.

Four other types of malignant bone tumors were seen: fibrosarcoma—2 cases; reticulum cell sarcoma, hemangiosarcoma, and mesenchymoma—1 case each. Only one benign lesion (hamartoma) was seen.

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## Increase in Veterinarians in Britain

Members on the register of the Royal College of Veterinary Surgeons, in Britain, have nearly doubled in two decades—3,458 in 1935 and 6,355 in 1957. The schools still are filled and the graduate is able to choose his job. Two reasons given for this favorable economic position are: the postwar prosperity of agriculture, and the government's program for the eradication of tuberculosis from cattle. The latter may be completed in two or three years. If a comprehensive program could be inaugurated for the eradication of Johne's disease, which has a more serious effect on the cattle than tuberculosis, the profession could anticipate another 20 years of growth and prosperity.—*Editorial, Brit. Vet. J. (July, 1958): 243.*

**Effect of Light on Animals.**—Light is a factor in several phenomena in the welfare of animals. It has a gonadotrophic effect in animals such as horses, cattle, and sheep. It affects the growth and loss of hair and wool and it probably influences the fat content of milk. The antirachitic action of light and the sensitivity to light which results from the circulation of certain substances in the blood stream are well-known.—*Th. Stegenga in Tijdschr. Diergeneesk. (Oct. 15, 1958): 987.*

## Contamination of Ophthalmic Ointments. —Of 83 ophthalmic ointments tested, only

TABLE 1—Contamination of Ophthalmic Ointments

Type of ointment	No. tested	No. sterile	Av. No. of bacteria/Gm.
Antibiotic	28	11	—
Sulfa-containing	9	1	12
Mercury-containing	21	0	44
Cortisone and hydrocortisone	4	0	14
Boric acid	6	0	55
Miscellaneous	15	0	65

12 were sterile (table 1).—*J. Am. Pharm. A. (March, 1958): 193.*

## Swine Diseases as Seen in Tennessee

**Hog cholera** has not been common in recent years, but is more difficult to diagnose. Some affected swine show no lesions and button ulcers are only occasionally seen. There has been little postvaccination trouble if the pigs are healthy, most of the trouble being in pigs vaccinated after they have passed through stockyards.

**Virus pneumonia** at present causes greater losses than all other swine diseases combined. Large herds and "pig parlors" have increased the concentration of pigs and the losses. This disease has been present for a long time but either was not recognized or was called "pasteurellosis." It is treated by dispensing 1 lb. of sodium sulfathiazole in 1 gal. of water to which a pint of "cornhusker" is added, with instructions to use 1 pt. of this mixture in 15 gal. of drinking water for five to seven days. If necessary, this course is repeated after an interval of one week. Where possible, owners are advised to raise their own breeding stock, using well-separated pastures, farrowing houses, and watering troughs. These measures are worth all they cost.

**Swine erysipelas** was first seen in 1938, and became the most costly swine disease in the area until virus pneumonia appeared. In the acute form, if diagnosed and treated early with anti-swine erysipelas serum (5 to 20 ml.) and penicillin (5,000 units per/lb.), most animals recover in a short time.

**Atrophic rhinitis** has been increasing for four or five years. Since there is no effective treatment, clients should be advised to slaughter the herd, then after several months, start a new herd in uncontaminated pens and pastures. The disease should

not be confused with bullnose.—W. R. Lawrence in *Georgia Vet. (July-Aug., 1958)*: 9.

### Aldrin Poisoning in Lambs

When about 40 of 107 suckling lambs, 5 to 9 weeks old, developed contagious pustular dermatitis, the owner treated the entire group by immersing their muzzles in concentrated aldrin for a few seconds each. Within four hours, 8 had died; in 24 hours, 30 had died and all were showing lethargy, inappetence, salivation, or fits. All but 2 of the 107 lambs died.—J. K. L. Pearson et al. in *Vet. Rec. (Sept. 27, 1958)*: 783.

*Pathogenic Synergism of Ascarides and Newcastle Disease Virus.*—*Ascaridia galli* ova (150) were given *per os* to each of 40 chickens, 5 weeks old. When infection was established, the chickens were then infected with Newcastle disease virus and, as they died, the nematodes were removed. The virus could be isolated from them but not from their ova. The survival time following virus infection was longer for the ascarid-infected chickens than for the controls.

It was concluded that *A. galli* is not a true vector for Newcastle disease but that it might perpetuate the virus in a given area. Extracts of the nematodes had no effect *in vitro* on the virus; therefore, the increased survival time of the ascarid-infected chicks may have been due to interference with the normal metabolism, thus creating abnormal conditions for multiplication of the virus.—*Vet. Bull. (Sept., 1958)*: Item 2873.

### Wet Belly Disease of Mink

Wet belly disease accounts for thousands of dollars of loss annually to the mink industry. It occurs only in the fall and is characterized by an accumulation of urine in the fur adjacent to the urinary orifice, with permanent damage to the pelt. The incidence of this disease in mink on a ranch diet containing 12.5 per cent fat was 19 per cent while in mink of identical genetic background on a similar diet containing 25.0 per cent fat it was 40 per cent.

Two hypotheses as to the correlation between the level of fat in the diet and the

incidence of wet belly disease, are: (1) fat contains a factor which is the causative agent; (2) fat, *per se*, may not be the causative agent. The high caloric content of the high fat diet could be responsible for a reduced intake of certain required nutrients.

One experiment indicates that the reduction in the fat content of the diet would result in a reduction in the incidence of wet belly disease; also that choline may be a factor. The level of fat in the diet can be reduced by using low-fat ingredients, such as cottage cheese, lean horse meat, whale meat, rabbits' trimmed lungs, and lean varieties of fish; by supplying a diet containing a minimum of 20 per cent of a fortified cereal mix; or by adding 5 per cent wheat germ meal to the diet.—W. L. Leoschke in *Am. Fur Breeder (Aug., 1958)*: 12.

### Mosquitoes Transmit Fowlpox

Fowlpox occurs in most poultry-raising areas of Australia and, while epornitics seem to be seasonal, the disease does occur in all months of the year.

Transmission of the virus is believed to be mechanical. However, a virus not distinguishable from a fowlpox virus was recovered from three pools of *Culex fatigans* in 1954 and from seven pools in 1955; also from one pool of *Aedes notoscriptus* in 1955. *Culex fatigans* is present for long periods of the year and feeds almost exclusively on poultry.—D. B. Lee et al. in *Austral. Vet. J. (Aug., 1958)*: 230.

### Poliomyelitis Virus from a Parakeet

A boy, 9 years old, was bitten on the lip by a parakeet which was recovering from paralysis of the legs. A week later, the boy became ill and died in a few days. The diagnosis was bulbar poliomyelitis. Fecal material from both the boy and bird yielded type 1 poliomyelitis virus.

After the parakeet was killed, the same type of virus was isolated from its intestinal contents. Another bird which had been kept in the same cage died a few days earlier from a similar attack of paralysis. The authors imply that the bird was infected by poliomyelitis virus and transmitted it to the boy.—Sommerville, et al. in *Lancet (March 8, 1958)*.

## What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and accompanying radiographs depicting a diagnostic problem are usually published in each issue.

**Make your diagnosis from the picture below — then turn page ►**



This case was presented by  
Dr. Robert E. Storm, North  
Shore Animal Hospital,  
Evanston, Ill.

**Fig. 1-3—Radiographs: (1) lateral view of left (affected) leg; (2) antero-posterior view of same leg; and (3) lateral view of right leg.**

**History.**—A male Scottish Deerhound, 5 years old, limped slightly on the left foreleg. From the nature of the limp, the trouble appeared to be in the area of the carpus. The lameness had been present two weeks. The owner had no knowledge that the dog had been injured and no abrasions or swelling were found on the leg. Both front legs were radiographed.

## Here Is the Diagnosis

(Continued from preceding page)

### Diagnosis

Osteogenic sarcoma (early stage) of the distal portion of the radius of the left leg of a Deerhound.

### Comment

Bone tumors are difficult to diagnose in the early stages. This series of radiographs (fig. 4-7) shows the development of the tumor over a 46-day period. When the first radiograph was taken, the opinions of trained observers varied as to whether the lesion (fig. 1-2) was a neoplasm in early stages of development or an inflammation

area at the posterior margin of the radius near the ulna (fig. 4 A). The soft tissue changes were not detectable.

One observer suggested the lesions might be from a dog fight. Early inflammatory changes of the bone give a radiographic picture similar to the lesion seen in figures 4 A and B. Antibiotics were given for two weeks with the hope the lesion resulted from osteomyelitis and would re-

Radiographs of the left leg of the Deerhound showing the development of



Figure 4—June 28

Figure 5—July 24

(osteomyelitis). The changes seen in the first radiograph showed minor bone destruction (fig. 4). The periosteum was not elevated or ruptured except for a small

spond to the medication.

A radiograph taken 27 days later showed that the process had progressed slightly (fig. 5). The destruction to the cortex had

extended proximally (fig. 5A) and the rupture in the periosteum on the posterior (volar) margin between the radius and ulna had increased (fig. 5B). The anteroposterior view showed bulging of the periosteum (fig. 5C).

A radiograph (fig. 6) taken four days after figure 5 showed the destruction to have extended farther proximally, the bulge and rupture of the periosteum had extended and the osteoblastic tissue had invaded the soft tissue.

The final radiograph (fig. 7), taken 15 days after figure 6 (46 days after the initial radiograph), shows the "sunburst" ray formation. The bone spicules radiated perpendicularly from the ruptured periosteum. Notice that this tumor has not extended distally. Osteogenic sarcomas rarely

extend through an epiphyseal line or invade a joint. They metastasize early, usually by the time the tumor can be diagnosed. High amputation at an early date is the only successful treatment.

In this case, amputation was refused and euthanasia was performed after the last radiograph (fig. 7) was taken. No tumor cells were found in the axillary and mediastinal lymph nodes or in the lungs.

#### Discussion

Records<sup>1</sup> were reviewed to determine the frequency, sex, age, breed, and location of 18 osteogenic tumors that were diagnosed by histological sections over a period of 11 years. Ten cases were in males and 8 in females. Only 5 were patients of regular

the osteogenic sarcoma in the 46 days from June 28 to Aug. 12, 1958



Figure 6—July 28



Figure 7—August 12



clients and 13 were referred from veterinarians. The incidence of these tumors is low; the 5 cases were found in approximately 70,000 regular hospital entries.

The age incidence of the dogs ranged from 10 months to 12 years; 8 were 6 years old or less and 10 were between 7 and 12 years old. Half of the affected dogs were 8, 9, or 10 years old. With the exception of 1 dog, a Boston Terrier, all osteogenic sarcomas occurred in large breeds: Great Danes 3, German Shepherd Dogs 3, Boxers 2, Chows 2, and one each in the Dalmatian, Collie, English Bull, Irish Setter, Short-Haired Pointer, Standard Poodle, and Scottish Deerhound.

The most frequent locations of the tumors were the proximal end of the humerus 5, distal end of tibia 3, proximal end of rib 3, distal end of femur 2, sinuses 2, distal end of radius 1, proximal end of ulna 1, and ilium 1.

In one report on the incidence of osteogenic sarcoma in man (469 cases), 291 were in males and 178 in females. The tumor occurred in all eight decades of life, but 40 per cent occurred in the second decade. The most frequent site was in the region of the knee; *i. e.*, the proximal end of the tibia and the distal end of the femur. The humerus was seldom affected.<sup>2</sup>

#### Summary

Osteogenic sarcomas in the dog seldom affect other than the large breeds, and usually the long bones. Age does not seem to be a factor, as it is in man. Both sexes are affected about equally.

<sup>2</sup>Records of the Riser Animal Hospital, Skokie, Ill.

<sup>2</sup>Dahlin, D. C.: Bone Tumors. Charles C Thomas, Springfield, Ill. (1957):57; 128-145.

#### Paratyphoid Infection in Chickens

Six species of *Salmonella* have caused paratyphoid infections in chickens, in the Netherlands, with mortality ranging from 12 to 75 per cent. *Salmonella thompson* has been recognized as a frequent cause of paratyphoid in chickens, but the others (*S. saint paul*, *S. senegal*, *S. vejle*, *S. infantis*, and *S. braenderup*) have seldom or never been implicated.

*Salmonella* infections, other than pullorum disease, are of growing importance in poultry and in human food poisoning. Good results were obtained, especially with oral treatments, with chlortetracycline (3 mg.

per chicken daily for 3 days) and also with furoxone (0.011% in the food for 4 days).—C. Huygelen in *Vlaams Diergeneesk. Tijdschr.* (Sept.-Oct. 1958):201.

#### Optical Perception in Dogs and Cats.—

When 300 dogs and 170 cats were confronted with pictures and dummies of cats, neither dogs nor cats recognized the paintings of cats. Dogs showed the most distinct reaction to cut-out cat pictures and fur dummies; cats took a fighting position when confronted with a painted plaster model. This shows that the surface plays the most important role in the recognition process. The closer to reality the surface is, the more distinct are the reactions.—M. Brodorotti, *vet. dissert. (abstr. in Die Vet-med., 11, (1958): 226.*

*Transmission of Antibodies Against Ascarides.*—In the human species and in rabbits, which have a somewhat similar type of placentation, immune bodies against ascarides are transmitted to the fetus from the mother and also to the young through the colostrum.

In rabbits, the concentration of antibody is four to eight times greater in the mother's blood than in her milk, and the latter level is about equal to that in the serum of the young.

When estrogens are injected into rabbits immunized against *Ascaris suum*, there is a transitory descent in the antibody level, whereas when adrenocorticotrophic hormone or cortisone are injected a distinct increase of short duration follows.—Rev. *Ibérica Parasitol. (July, 1958): 255.*

#### Listeriosis in Fowl

In *Listeria monocytogenes* infection in fowl, there are no pathognomonic signs or lesions. Primary *Listeria* infection in birds is usually a septicemia with myocardial or focal hepatic necrosis, or both. Occasionally, there is a localized encephalitis. Birds may play an important role in the transmission of the disease to other animals and man.—M. L. Gray in *Avian Dis. (Aug., 1958): 296.*

In much of the hog cholera we see in this area today, there are few or no lesions found at necropsy; seldom is it seen in epizootic form.—Carl H. Jones, Athens, Ga.



### Embedded Pin in the Lung of a Dog

LOUIS L. VINE, D.V.M.

*Chapel Hill, North Carolina*

On April 10, 1958, a female Miniature Schnauzer, 6 months old, was having episodes of severe coughing. A radiograph was made, with the startling discovery of a 2-inch corsage pin in the thorax, presumably in the bronchus.

The trachea was opened just anterior to the manubrium (fig. 1) and the pin was grasped with a forceps inserted into the bronchus. The pin was still immovable so it was cut into two pieces and each was removed with alligator forceps.

The wound was closed by covering the rings of the trachea with the surrounding fascia and suturing without regard for tracheal cartilage. During the entire operative procedure, a suction tube was kept in the trachea and bronchus to remove the ac-

Fig. 1—Radiograph showing a corsage pin embedded in the bronchus of a dog. The trachea was opened just anterior to the manubrium (arrow) and the pin was removed in two pieces with a forceps.



After consultation with a laryngologist, removal of the pin was attempted with a bronchoscope used for infants. Under general anesthesia, the pin was grasped with forceps but could not be moved because it was lodged at an angle at the bifurcation of the trachea, with the sharp point embedded in the wall. Due to the failure of bronchoscopy, a procedure involving further surgery was indicated.

Dr. Vine is a general practitioner in Chapel Hill, N. Car.

cumulating blood and fluid. The threat of foreign body aspiration was present during the entire procedure.

#### RESULTS

Postoperatively, the dog was watched for pulmonary congestion. A cough was present for about ten days. Antibiotics were used extensively to prevent pneumonia. Increased lung sounds were evident for about two months but the dog seemed well and made a satisfactory recovery.

### Prenatal Mortality in Swine

When the embryo or fetus of a uniparous mammal dies, it is usually aborted; however, in multiparous species, the fetus and its membranes are usually absorbed.

In swine, about 55 per cent of ovulated ova are represented at parturition by living pigs. Most of the prenatal loss probably

occurred about the time of attachment of the fertilized ova, i.e. the tenth to twentieth day.

Prenatal mortality increases roughly with increase of the size of the litter, which may account for the percentage loss being less in the first gestation than in subsequent pregnancies.—E. S. E. Hafez in *Southwest Vet.* (Fall, 1958): 41.

## Rabies Prophylaxis in Cattle

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RABIES IN CATTLE is an important economic problem in many parts of the world. During 1945 to 1950, cattle with an estimated value of well over \$200 thousand died annually of rabies in Georgia, largely in areas where the disease is prevalent in wildlife. In the North Atlantic and South-eastern States, rabies in cattle usually results from exposure to rabid foxes. In the Central Plains area, rabid skunks, and in Mexico, Central America, and parts of South America, vampire bats are the primary transmitting agents.

Dogs rarely transmit the disease to cattle, largely because of their close association with and dependence on man for food and shelter and because the general tendency of a rabid dog is to follow highways.

The natural habitat of wild animals and cattle is mutual, i.e., the fields and woodlots. I have known of as many as 15 cattle in one herd which have died of rabies where the disease was prevalent in foxes.

The vampire bat is dependent solely on fresh blood for its food. Although it will feed on any mammals or even birds, its principal source of blood is cattle. Many apparently normal vampire bats carry rabies virus in their saliva and transmit the disease while feeding. Cattle losses assume serious proportions in bat-infested areas. There are no known vampire bat colonies in the United States but the climate of the Gulf Coast and southern Florida is probably favorable to these animals; therefore, they may present a future problem.

There is no authentic report of cattle-to-cattle transmission of rabies. Although many people have taken the Pasteur treatment because of exposure to rabid cattle or their saliva, infection is rare. Bovine rabies, while not a primary public health problem, is certainly an economic problem which merits attention.

The prevention of rabies in cattle is dependent entirely upon the control, or preferably the eradication, of the disease in wildlife and dogs. The disease can be eradicated in the common vectors in North America, except possibly in the Arctic region, but this will not be accomplished for some time to come. Unfortunately, it is probably impossible to eradicate the vampire bat. Therefore, in areas where wildlife, notably foxes, skunks, and vampire bats, are infected with rabies, prophylactic immunization is the only practical solution for the prevention of the disease in cattle.

Livestock insurance is in many instances more economical to the cattle owner than immunization but insurance does not protect the cattle. Protection of livestock against disease is the chief reason for the existence of the veterinary profession; therefore, advocacy of insurance would reflect a purely negative, defeatist attitude.

### PROPHYLAXIS

Two types of anti-rabic vaccine, brain tissue killed-virus vaccine and chicken embryo-attenuated virus vaccine, are available for prophylaxis against rabies in cattle.

*Brain Tissue Killed-Virus Anti-Rabic Vaccine.*—This vaccine has been employed in the immunization of cattle for many years. Unfortunately, there have been no statistically valid controlled experiments reported which indicate the efficacy of the product with respect to the immunity induced, the preferred route of administration, or the proper dose of vaccine. Therefore, its use is in a sense empirical.

Thousands of cattle have been inoculated during the past 20 to 25 years in doses varying from 10 to 150 cc. per animal. It is impossible to determine the true value of the vaccine under these conditions. One can only extrapolate to cattle the results of controlled experiments and field trials on dogs and comparatively recent serological studies following injection of rabies antigens in both animals and man.

The development of modified living-virus vaccines has provided a new variety of effective prophylactic agents characterized by the ability to produce relatively long-lasting, solid immunities against the

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specific diseases; notably against canine distemper, canine hepatitis, and rabies.

A living, adequately-modified virus must actually survive and multiply in the cells of the host in order to stimulate solid immunity, but without causing clinical illness or pathological changes.

**Chicken Embryo-Attenuated Virus Anti-Rabic Vaccine.**—This is a lyophilized vaccine containing living rabies virus. In this country, most of the vaccine is made from the Flury strain of virus. Low egg passage (LEP) anti-rabic vaccine is prepared from this strain of virus which has been serially passed through 40 to 50 successive chicken embryos, thereby attenuating the virus and decreasing its invasive or pathogenic properties to such degree that it will not reproduce rabies when injected intramuscularly in the dog. When it was released for experimental use in 1949, nothing was known concerning its safety or immunizing properties in cattle.

Concurrent with an experimental field trial study of LEP vaccine in dogs by the Georgia State Department of Health, a total of 121 head of cattle in four herds

was injected with LEP vaccine.<sup>5</sup> In one herd of 81 animals, there were 15 deaths between 19 and 28 days following inoculation. The clinical signs and pathological changes in all 15 animals were atypical of rabies. The brains were negative for Negri bodies. Rabies virus was isolated from the brains of most of these animals and it was eventually found to be the Flury strain. The LEP virus was probably pathogenic for cattle. This opinion is further substantiated by isolated reports of the use of LEP vaccine in cattle, with adverse results.

Subsequently, high egg passage (HEP) anti-rabic vaccine was prepared from a virus which had been serially passed through 170 to 190 successive chicken embryos, which lowered its invasive or pathogenic properties to such a degree it would not reproduce rabies when injected intramuscularly in cattle.

Since laboratory data are never adequate to prove the safety and antigenicity of a living virus product, 4,758 cattle in a vampire bat-infested area in Honduras were inoculated with chicken embryo vaccine.<sup>5</sup> It was demonstrated to be safe

TABLE 1—Results of Challenge Inoculation with Street Virus Six and One Half Months Following Vaccination of Cattle with Chicken Embryo-Adapted Rabies Virus

	Brand	Age	Days from challenge until death	Death due to rabies	Negri bodies	Mouse inoculation	
						Brain	Gland
Vaccinated 10/23/52	23	Adult	S*	....	....	....	....
	27	Adult	S	....	....	....	....
	31	Adult	S	....	....	....	....
	35	Adult	S	....	....	....	....
	39	Adult	S	....	....	....	....
	43	Adult	S	....	....	....	....
	45	Adult	S	....	....	....	....
	52	Adult	S	....	....	....	....
	36	Calf	S	....	....	....	....
	44	Calf	S	....	....	....	....
	47	Calf	S	....	....	....	....
	51	Calf	78	+	+	+	+
	24	Calf	91	+	+	+	+
	28	Calf	16	+	+	+	+
	32	Calf	19	+	+	+	+
	40	Calf	25	+	+	+	+
Nonvaccinated controls	46	Adult	S*	....	....	....	....
	50	Adult	S	....	....	....	....
	25	Adult	21	+	+	+	+
	29	Adult	28	+	+	+	+
	34	Adult	21	+	+	+	+
	38	Adult	21	+	+	+	+
	42	Adult	26	+	+	+	+
	48	Adult	34	+	+	+	+
	22	Calf	S	....	....	....	....
	41	Calf	S	....	....	....	....
	21	Calf	21	+	+	+	+
	30	Calf	24	+	+	+	+
	33	Calf	26	+	+	+	+
	37	Calf	21	+	+	+	+
	26	Calf	49	+	+	+	+
	49	Calf	30	+	+	+	+

\*Survived challenge through an observation period of 18 weeks, after which they were killed and examined.

insofar as transmission of rabies was concerned and, although there were no unvaccinated controls, the vaccine appeared to give satisfactory protection against vampire bat rabies.

A similar but controlled experimental field trial was then conducted in Georgia.<sup>4</sup> A total of 1,107 cattle in 29 herds in a fox infested area was inoculated with HEP vaccine, leaving approximately 25 per cent of the cattle in each herd as uninoculated control animals. During a three-month postinoculation observation period, no animals in either the inoculated or control group died with clinical, histopathological, or serological evidence attributable to the vaccine or to the virus contained therein.

To obtain data on the immunity response, 8 adult cattle and 8 calves from these herds were challenged with virulent street virus eight months after inoculation. Noninoculated cattle of approximately the same age were used as controls.<sup>4</sup> Although the number of animals was small, the results (table 1) indicated that a single injection of HEP anti-rabic vaccine produced satisfactory protection in adults for at least six months but did not produce the same degree of protection in 6- to 9-month-old calves.

A challenge study, using 18 calves 6 to 8 months old, likewise indicated that the immunity response following a single injection of HEP anti-rabic vaccine is not satisfactory in this age group.<sup>2</sup> However, several thousand cattle were reported to have been immunized with HEP vaccine in an area in North Carolina where fox rabies was prevalent, with satisfactory results.<sup>1</sup>

#### IMMUNITY

Judging by extensive field reports and other rabies vaccine studies, killed-virus anti-rabic vaccine is safe for cattle and probably confers a satisfactory immunity for several months when injected intramuscularly in proper dosage. It is doubtful that a small single dose injected subcutaneously is of much value.

On the other hand, sufficient controlled and field data on the safety and immunity response have been accumulated to justify the universal use of HEP chicken embryo rabies vaccine in cattle. Although a single dose will confer satisfactory protection for adult animals, inoculation should be re-

peated in calves in a few months. How long the immunity will persist is not known.

#### HANDLING AND ADMINISTRATION

Brain tissue vaccine contains killed virus, and methods of storage and injection are the same as with any other vaccine or bacterin. It is customarily injected subcutaneously; however, it is our opinion that much better immunity could be expected when injected intramuscularly in divided doses of 30 to 60 cc. each, four or five days apart.

To preserve the immunizing property of chicken embryo, lyophilized, attenuated-virus vaccine, which is dependent on the virus being alive when injected, reputable manufacturers make every effort to produce, test, and ship vaccines so that they will reach the practitioner in a highly potent state. The vaccine must then be kept at ordinary refrigeration at all times. Freezing hardens the stopper, permitting air and moisture to penetrate the ampule and kill the virus.

Outdated lots of vaccine should not be used. The vaccine should be injected as soon as possible after it is reconstituted, and any portions which remain beyond 45 minutes destroyed. Dry, clean syringes and needles should be sterilized by autoclaving, dry heat, or boiling. Antiseptic solutions and detergents should not be used on the needles, syringes, or skin since even a trace of a disinfectant may be harmful to the virus. Injections should be made in the gluteal muscles, never subcutaneously. The vaccine must not be exposed to sunlight before or after it is reconstituted. Only HEP vaccine should be used for immunization of cattle. In view of the imperative nature of such precautions, living virus vaccines should never be licensed for lay use.

#### CONCLUSION

It is our opinion that either brain tissue or chicken embryo vaccine will produce satisfactory immunity for a few months when injected intramuscularly in adequate dosage. However, although not yet proved, it is reasonable to presume that the immunity induced in cattle by a living-virus vaccine will persist for a longer period than that by a killed-virus product. Also, the price differential per dose, about \$0.70 to \$1.40 for living virus vaccine vs. \$3.00 to \$6.00 for brain tissue, greatly favors the

use of chicken embryo vaccine. In fact, it is the high cost of vaccination that often leads the owner to take a chance on future losses or to take out insurance.

Both types of vaccines are safe from the standpoint of transmission of rabies but neither can be depended upon to induce immunity in less than 20 days. The advisability of inoculating a herd of cattle which is known to have been exposed to a rabid animal, particularly a fox or skunk, is questionable. Deaths occurring ten to 15 days later are difficult to explain.

The veterinarian is obligated to explain two things to his clientele: (1) the nature of rabies in cattle, especially if they are in areas where fox or skunk rabies abound, and (2) the possibility of immunization with the kind of vaccine he believes to be indicated. Immunization of cattle is safe

and it is practical if the cost can be kept reasonable.

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## Removal of a Hepatic Abscess in a Cat

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In August, 1957, a cat showed signs of anorexia, weight loss, occasional vomiting, and mild jaundice. Poor appetite several weeks previously was not considered important because the cat was a known scavenger.

At clinical examination the temperature was 99.0 F., the mucous membranes were pale yellow, and the heart and lungs were normal. Palpation of the abdomen indicated a small mass in the region of the liver. A differential leukocyte count showed 77 per cent segmented neutrophils, 3 per cent nonsegmented neutrophils, 11 per cent lymphocytes, 2 per cent monocytes, 7 per cent eosinophils, and 5 per cent normoblasts. A grave prognosis was tendered, as a result of which the owner requested euthanasia contingent upon inspection of the mass by means of a laparotomy.

The abdominal organs were normal in appearance except for the left portion of the liver, which was rust colored and enlarged. The left median and lateral lobes were ligated at their bases and removed. When further examination revealed partial involvement of the caudate lobe and the

caudal portion of the right lateral lobe, these were also removed. Thus, only the right median lobe, the cranial portion of the lateral lobe, and the gallbladder were left. Histological and cultural studies\* of the excised tissues revealed a sterile abscess.

After three days of routine postoperative care, the cat was too fractious to handle so it was sent home. A month after surgery, the owner reported the cat to be healthy. A year later it was still normal.

Made at the department of veterinary pathology, Ohio State University, Columbus.

## Clostridial Infection in Dogs

Although much has been reported concerning the pathogenesis of different clostridia for man, cattle, sheep, and pigs, little has been reported for dogs. *Clostridium fesceri* (chauvoei), which causes blackleg in cattle and sometimes in sheep, is fatal to guinea pigs and sometimes to other laboratory animals. Dogs were found to be highly refractory to *Cl. fesceri*.

When 34 dogs, in Egypt, were inoculated intramuscularly or subcutaneously with *Cl. septicum*, which causes gas gangrene in man, sheep, cattle, and certain laboratory animals, they were highly susceptible. Extensive crepitating swellings developed, accompanied by exhaustion, anorexia, septicemia, and death. Penicillin given within 12 hours after inoculation controlled the infection.—H. Helmy in Tijdschr. Diergeneesk. (Nov., 1958): 1089.

Dr. Kersting is a general practitioner in Columbus, Ohio.



# The Ineffectiveness of Hygromycin Against Gastrointestinal Nematodes of Sheep

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THE ANTIBIOTIC, hygromycin, was recently introduced for use against ascarides and other nematodes of swine. This study was carried out to determine whether it is of value against the gastrointestinal nematodes of sheep.\*

## MATERIALS AND METHODS

Twenty grade feeder lambs, purchased in Minnesota in December, 1957, were used in this study. During the experiment, they were kept in a weather-tight barn, in two groups of 10 each. The control group was fed a ration of corn (25%), bran (25%), soybean oil meal (15%), corn cob meal (33%), bone meal (1.5%), and trace-mineralized salt (0.5%), free choice.

The treated group was fed the same ration to which had been added 0.33 per cent of a premix containing 2.4 Gm. of hygromycin per pound, or 16.0 Gm. per ton, of feed. They were fed this ration during the period of the experiment from Jan. 3, 1958, to April 15, 1958.

Fecal nematode egg counts were made December 20 and 23 before treatment, and six other counts were made during the treatment period on January 15 and 23, February 21, March 13 and 27, and April 15, using the McMaster technique.<sup>1</sup>

## RESULTS

The average weight of the treated lambs was 75.1 lb. at the beginning and 77.0 lb. at the end of the experiment, an average gain of 1.9 lb. However, 3 of the lambs died from parasitism and pneumonia during the course of the experiment and necropsies were done.\*\*

The first lamb died March 1; its initial weight was 73.0 lb. but its terminal weight was not recorded. The second lamb died

March 22; its initial weight was 68.0 lb. and its terminal weight 33.0 lb., a loss of 35.0 lb. The third lamb died March 25; its initial weight was 64.0 lb. and its terminal weight 37.0 lb., a loss of 27.0 lb.

The average weight of the control lambs at the beginning of the experiment was 73.2 lb. One lamb died April 14; its initial weight was 66.0 lb. and its terminal weight 60.0 lb., a loss of 6.0 lb. The average weight of the remainder at the end of the experiment was 109.5 lb., an average gain of 36.3 lb.

The average strongylate fecal egg counts of the lambs are shown (graph 1). The term "strongylate" refers to *Haemonchus*, *Trichostrongylus*, *Cooperia*, *Ostertagia*, *Oesophagostomum*, *Bunostomum*, and related nematodes. In the present study, *Haemonchus contortus* was by far the most important species found at necropsy or at slaughter.

The average strongylate fecal egg count of the treated lambs was 870 eggs per gram (e.p.g.) on December 20 and 1,770 e.p.g. on December 23 before the animals were placed on the medicated feed. It decreased to 429 e.p.g. on January 23 and then rose to 12,167 on April 15. The last counts of the 3 lambs that died were 15,600, 18,600, and 600 e.p.g., respectively.

The average strongylate fecal egg count of the control lambs was 1,770 e.p.g. on December 20 and 810 on December 23. It decreased to 300 e.p.g. on January 23 and then increased to 3,638 on April 15. The last count of the lamb which died was 14,100 e.p.g.

The average *Strongyloides papillosus* fecal egg counts of the lambs are shown (graph 2). That of the treated lambs was 2,250 e.p.g. on December 20 and 3,740 on December 23 before the animals were treated. It decreased to 686 e.p.g. on January 23, increased to a peak of 7,600 on February 21, decreased again to 600 on March 13, and increased again to 2,433 on April 15. The high count on February 21

From the College of Veterinary Medicine and Animal Science Department, Agricultural Experiment Station, University of Illinois, Urbana.

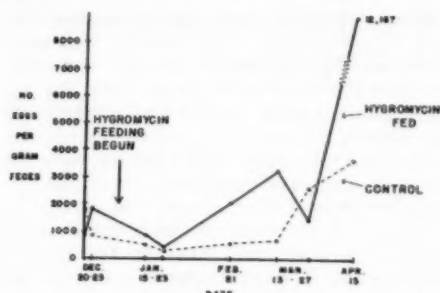
The authors thank Kenneth M. McKee and Richard H. Condry for feeding the experimental animals and collecting specimens.

\*The hygromycin used for this study was supplied by Eli Lilly & Co., Indianapolis, Ind.

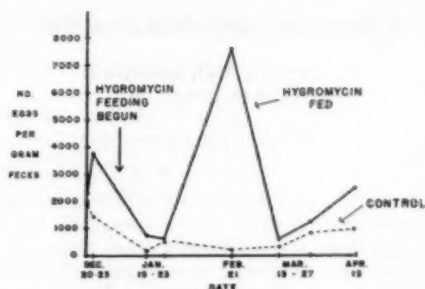
<sup>1</sup>Whitlock, H. V.: Some Modifications of the McMaster Helminth Egg-Counting Technique and Apparatus. J. Council Sci. and Indust. Res., 21, (1948): 177-180.

<sup>2</sup>At the Diagnostic Laboratory of the Illinois State Department of Agriculture and the College of Veterinary Medicine, University of Illinois, Urbana.





Graph 1—Effect of 16.0 Gm. of hygromycin per ton of feed on strongylate nematode fecal egg counts in feeder lambs.



Graph 2—Effect of 16.0 Gm. of hygromycin per ton of feed on *Strongyloides papillosus* fecal egg counts in feeder lambs.

was due to an extremely high count of 66,600 e.p.g. in the lamb which died a few days later; without it, the average count would have been 225 e.p.g. The last count before death of the other 2 lambs which died were 600 and 300 e.p.g.

The average *S. papillosus* fecal egg count of the control lambs was 1,890 e.p.g. on December 20 and 1,470 on December 23. It decreased to 240 e.p.g. on January 15 and remained near that level until March 13, after which it increased to 925 on April 15. The last count for the lamb which died was 0 e.p.g.

Death was due to parasitism in 2 of the 3 treated animals which died. One had 15,600 strongylate and 66,600 *S. papillosus* e.p.g.; the other had 18,600 strongylate and 600 *S. papillosus* e.p.g. before death. Pneumonia was also present. The third lamb died of pneumonia. It had 600 strongylate and 300 *S. papillosus* e.p.g. before death.

The death of the control lamb was due to haemonchosis. It had 14,000 strongylate and 0 *S. papillosus* e.p.g. before death.

#### DISCUSSION

Hygromycin was clearly ineffective against *S. papillosus* and the strongylate nematodes in the present study. Furthermore, it was injurious since the treated sheep gained almost nothing. This may have been due to its action on the rumen flora, but no study was made of this.

#### SUMMARY

The feeding of 16.0 Gm. of hygromycin per ton of feed to feeder lambs for three and one half months from January to mid-

April had no effect on *Strongyloides papillosus*, *Haemonchus contortus*, and other gastrointestinal nematodes. Three of 10 treated lambs and 1 of 10 controls died from parasitism and pneumonia.

The surviving treated lambs gained an average of only 1.9 lb. during the feeding period, while the surviving controls gained an average of 36.3 lb.

*Effect of Analeptics on Pentobarbitone Anesthesia in the Cat.*—The value of 3,3-methylethylglutarimide as an analeptic in cats anesthetized with pentobarbitone sodium was assessed, using young adult cats. Each was anesthetized by slow injection of the barbiturate over a period of five to seven minutes, until deep anesthesia had been attained, i.e., the loss of palpebral, corneal, and pedal reflexes.

The analeptic was given 15 minutes after the anesthetic. When the analeptic drug was given, the recovery time was significantly shortened although not sufficiently so to be of much practical value as a routine procedure. On the other hand, it is efficacious and of value in cats given an overdose of barbiturate. A dose of analeptic should be approximately seven-tenths of the dose of barbiturate.—*J. Sanford in Vet. Rec. (July 19, 1958): 592.*

*A Grass Snake Intermediate Host for Tapeworms of the Cat.*—Snakes common in the outskirts of Algiers often harbor cysts containing larvae of tapeworms. When a young cat was fed the intestine of such a snake and killed six weeks later, it was infected with many of these tapeworms.—(*Arch. Inst. Pasteur, Algiers, 36:41-54*) *abstr. in Vet. Bull. (Oct., 1958): Item 3279.*

## A Ruminocolic Fistula in a Ewe

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A rare, apparently naturally occurring, ruminocolic fistula was observed in a mixed-breed ewe of Rambouillet type, purchased for anatomic dissection. The ewe had been embalmed and her vessels injected with colored latex.

During the dissection, when the rib cage was removed and the posterior dorsal blind sac of the rumen was reflected forward, a fistula (fig. 1) was observed. The fistula extended from the medial surface of the posterior dorsal blind sac to the distal portion of the colon, beyond the spiral colon. The fistula was 4 cm. long and was located anteroventral to the left kidney. It was patent, and there was no gross evidence of a

layers: tunica mucosa, tunica muscularis, and tunica serosa. The fistular wall consisted only of the tunica mucosa and serosa; the tunica muscularis of both the rumen and the colon terminated abruptly at the fistula. A stratified squamous epithelium lined the lumen of the fistula, with the stratum corneum prominent near the rumen and almost lacking near the colon.

There were several vesicular areas in the stratum lucidum, which resembled that in the rumen. The submucosal layer of the tunica mucosa formed the major portion of the fistular wall, and it was surrounded by serosa. There were no inflammatory areas which would suggest a foreign body perforation, and there is no known embryological connection between these two viscera.

The two possible explanations for the occurrence of this fistula are: (1) the fistula represents a healing over of a foreign body perforation, and (2) these two viscera came in contact in the fetus and, by an unknown mechanism, their lumina became continuous.

This is believed to be the first report of this condition in a ruminant, as an extensive search of the literature failed to find a ruminocolic fistula described.

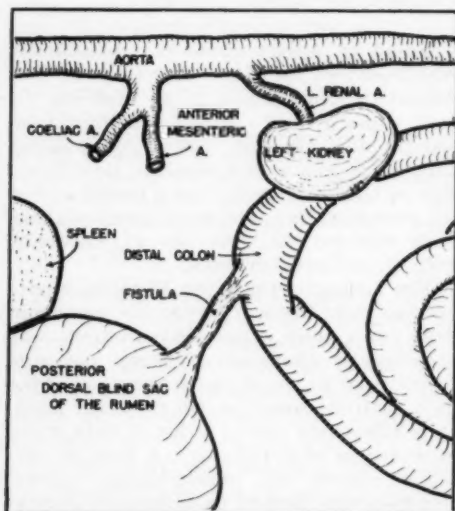


Fig. 1—A drawing showing relationship of ruminocolic fistula to other abdominal structures in a ewe.

foreign body perforation. The involved structures were removed, opened, and a representative section removed for histological examination.

Microscopically, the walls of the rumen and colon consisted of the three typical

## Adenomatosis of Sheep's Lungs

Infectious adenomatosis (jagziekte) was transmitted to 2 of 4 sheep using material from lungs which had been frozen for 52 months. The extract was inoculated directly into the lung, into the trachea, and intranasally. At necropsy, after 14 months, the lesions were small but typical.—*Vet. Bull. (Sept., 1958): Item 2923.*

## Erysipelas Induced in Pigs by Scarification of the Tonsils

Of 14 pigs in which the tonsils were scarified and virulent erysipelas cultures were rubbed in with a surgical spoon, in Hungary, 13 showed a rise in temperature, 11 developed skin lesions, and 1 died with erysipelas septicemia.

None of 29 pigs vaccinated three weeks previously with different adsorbed bacterins were affected. This method of infection approaches natural infection more closely than does the percutaneous method.—*B. Károly and K. György in Magyar allatorv. Lap. (Oct., 1958): 298.*

## Comparison of Infectious Bovine Rhinotracheitis, Shipping Fever, and Calf Diphtheria of Cattle

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INFECTIOUS BOVINE rhinotracheitis, an acute contagious disease of cattle, is characterized by fever, rhinitis, and tracheitis, and is caused by a virus. Shipping fever, an acute infectious disease of cattle, is characterized by fever, dyspnea, and fibrinous

pneumonia, and is of unknown cause. Calf diphtheria, an acute or chronic infectious disease of cattle, is characterized by fever, stertorous breathing, necrotizing laryngitis, and is of unknown primary cause.

These infections, a triumvirate of respiratory diseases of feedlot cattle, cause extensive economic loss through mortality, loss of physical condition, inefficient feed utilization, and expensive treatment.

From the College of Veterinary Medicine and Agricultural Experiment Station, Colorado State University, Fort Collins.

TABLE 1—Comparison of Infectious Bovine Rhinotracheitis, Shipping Fever, and Calf Diphtheria of Cattle

	Infectious bovine rhinotracheitis	Shipping fever	Calf diphtheria
<b>General clinical signs:</b>			
Temperature	104-108 F.	104-108 F.	104-106 F.
Diarrhea	Usually absent	Variable	Absent
Leukocytes	Slightly elevated	Elevated	Unknown
Respiration	Rapid; cough; dyspnea	Rapid, painful cough; abdominal breathing	Stertorous; dyspnea; cough; oral breathing
Posture	-----	Elbows abducted; head lowered	Head extended
<b>Local clinical signs:</b>			
Nasal cavity	Rhinitis; discharge	Rhinitis; discharge	Normal
Larynx	Normal to laryngitis	Normal to laryngitis	Necrosis of vocal cords and arytenoid cartilage; rales; stenosis; fetid odor
Trachea	Severe tracheitis	Tracheitis	Normal
Lungs	Normal	Decreased vesicular sound anteroventrally; increased bronchial sounds	Normal
Pleura	Normal	Pleuritic friction sound	Normal
<b>Epizootiology:</b>			
Etiological agent	Virus	Not established	Primary unknown; secondary Spherophorus necrophorus
Predisposing cause	Unknown	Stresses	Unknown
Season	Higher fall and winter	Higher fall and winter	Higher fall and winter
Morbidity (herd)	18 per cent average	Up to 20 per cent	1 to 2 per cent
Age	6 months to adult	6 months to adult	1 month to 2 years
Mortality of affected animals	3 per cent	Up to 20 per cent	Up to 20 per cent
Immunizing agent	Vaccine	No effective agent	None
Transmissibility	Aerosol; fomites	Unknown	Unknown
Incubation period	2 to 4 days	Unknown	Unknown
<b>Postmortem findings:</b>			
Nasal cavity	Severe rhinitis; sinusitis	Rhinitis; sinusitis	Normal
Larynx	Normal to laryngitis	Normal to laryngitis	Necrosis of vocal cords and arytenoid cartilages
Trachea	Catarrhal to diphtheritic tracheitis	Catarrhal tracheitis	Normal
Lungs	Normal	Fibrinous pneumonia	Normal
Pleura	Normal	Fibrinous pleuritis	Normal

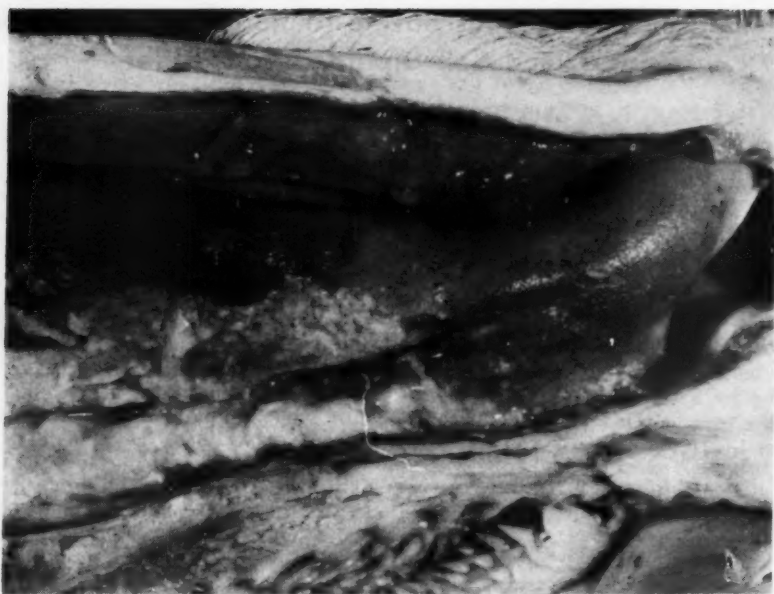


Fig. 1—Left anterior nasal cavity of a feedlot steer affected with bovine rhinotracheitis. The dorsal turbinate has a surface deposit of mucus, while the ventral turbinate and the ventral nasal meatus are covered with mucopurulent exudate. x 0.8.

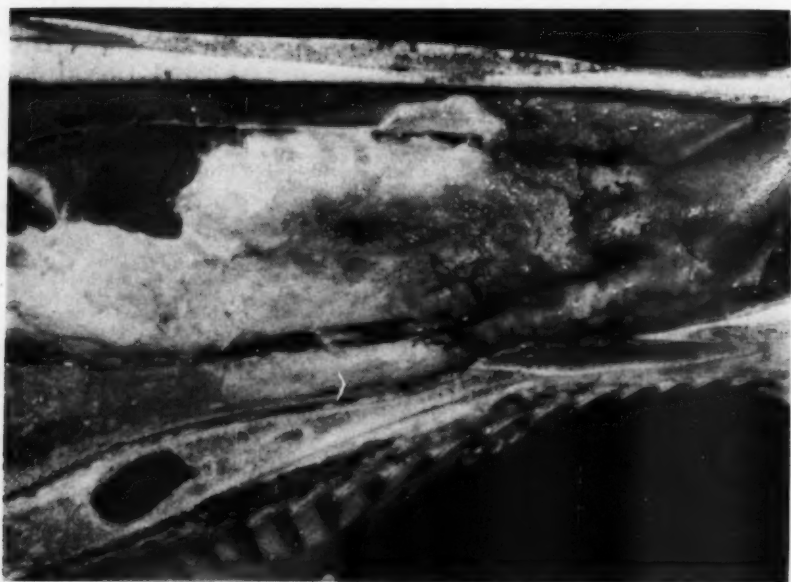


Fig. 2—Left anterior nasal cavity of a feedlot steer affected with bovine rhinotracheitis. The mucosae of the turbinates and meatuses are covered with a deposit of mucopurulent exudate. x 0.8.

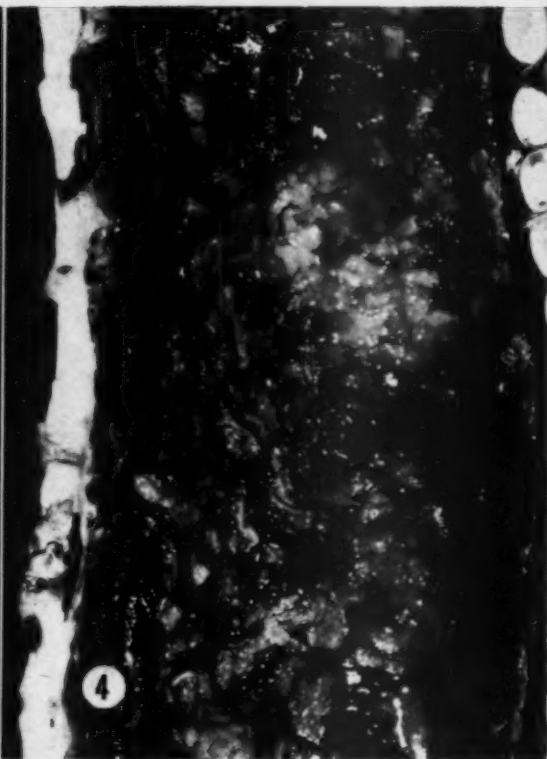


Fig. 3—Interior of an opened trachea from a feedlot heifer affected with infectious bovine rhinotracheitis. Multiple erosions and deposits of exudate are present on the mucosa. x 1.2.

Fig. 4—Interior of an opened trachea from a feedlot steer affected with severe and fatal infectious bovine rhinotracheitis. The necrosed and inflamed mucosa is covered with a deposit of mucus, fibrin, and purulent exudate. x 1.2.

Fig. 5—Left lung of a feedlot steer affected with shipping fever. The apical, cardiac, and anteroventral part of the diaphragmatic lobes are pneumonic. Fibrinous pleuritis is extensive over the cardiac and diaphragmatic lobes. x 0.25.

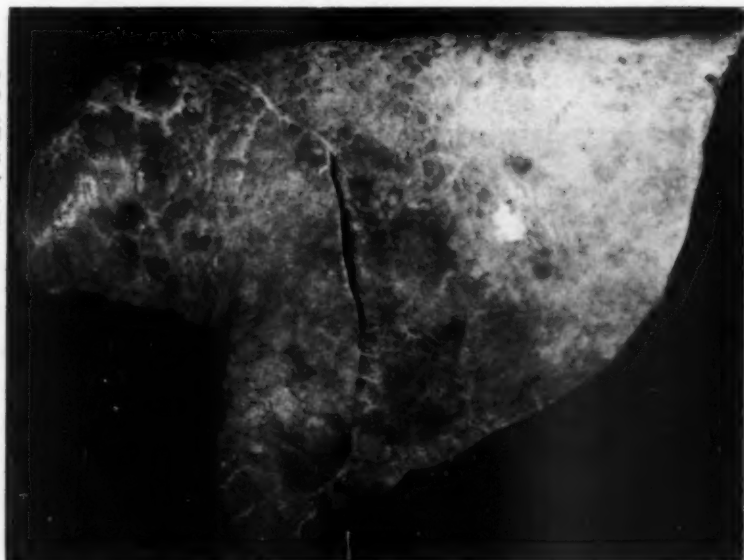






Fig. 6—Cut surface of cardiac lobe of lung of a feedlot heifer affected with shipping fever. Red and gray hepatization has developed.  $\times 1.4$ .

As acute respiratory diseases, the three present many similarities. Differential diagnosis is often difficult. Careful study of history, signs, and lesions usually enables

accurate differential diagnosis. Visual examination of the larynx by means of a laryngoscope provides unequivocal information on calf diphtheria. Laboratory tech-

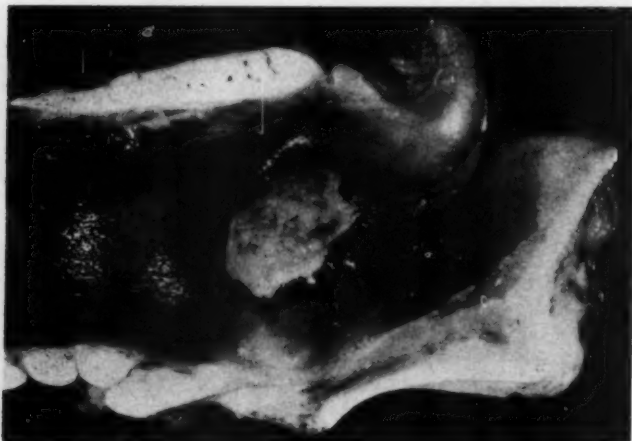


Fig. 7—Mucosal surface of the left side of the larynx of a feedlot steer in an early stage of calf diphtheria. The mucosa of the vocal cord and the vocal process of the arytenoid cartilage is necrotic.  $\times 0.8$ .



Fig. 8—Mucosal surface of the right side of the larynx from a feedlot heifer affected with severe calf diphtheria. The mucosa, vocal cord, and vocal process of the arytenoid cartilage are necrotic. x 1.0.

niques may be necessary to confirm some diagnoses of infectious bovine rhinotracheitis. Discerning auscultation is helpful in identifying the three diseases.

During uncomplicated stages, each of the three diseases is recognizable. Frequently, in advanced stages, complications render them indistinguishable. Animals with infectious bovine rhinotracheitis or calf diphtheria may develop bronchopneumonia. Animals with infectious bovine rhinotracheitis or shipping fever may contract calf diphtheria, and animals with shipping fever may show severe rhinitis.

The characteristics of uncomplicated infectious bovine rhinotracheitis, shipping fever, and calf diphtheria are compared (table 1). Primary lesions of each disease are shown (fig. 1-8).

### Comparative Brucella Vaccination

*Brucella abortus* strain 19 vaccine is effective in cattle and is used in almost all countries. However, it can cause infection in man. Its use on a large scale, as a prophylactic against *Brucella melitensis* infection in man, is reported.

Of 618 particularly exposed but serologically negative persons vaccinated, including 204 students of veterinary medicine,

none showed bad effects. Of 161 blood cultures attempted within two weeks post-inoculation, the organism was recovered from only one. Of the vaccinated persons, only 0.5 per cent developed *Br. melitensis* infection compared with 2.3 per cent of the nonvaccinated control persons. Later, 200,000 persons were vaccinated, resulting in a reduction in morbidity to about one tenth of that in nonvaccinated persons.—M. Seeleman and K. Borger in *Monatsh. f. Tierheilk.*, 10, (1958): 130.

**Evaluation of the Complement-Fixation Test for Anaplasmosis.**—In a herd of 350 cattle, 19 were positive to the complement-fixation test for *Anaplasma marginale*, in 1953. Nine were slaughtered but the rest were treated with large doses of oxytetracycline and were negative in eight months. Subsequent annual tests revealed 1 doubtful reactor in 1954, 4 in 1955, and 1 in 1956.

In a herd of about 160 cattle tested in 1953, 61 were positive or doubtful and were culled. In 1954, 5 more positive reactors and, in 1955, 2 doubtful reactors were removed. In 1956, all of the cattle were negative.—Roby et al. in *Proc. U.S. Livestock San. A.* (Nov., 1956): 60.

# Survival of a Guinea Pig Following Infection with Street Rabies Virus—A Case Report

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SYRIAN HAMSTERS recovering from inapparent "street" rabies virus infections were reported to be resistant to homologous challenge.<sup>2</sup> However, other investigators have indicated that rabies virus infections in mammals is 100 per cent fatal.<sup>1</sup> Animals showing clinical signs of rabies usually die a few days later. That occasionally an animal can develop paralytic rabies and survive is the basis of this case report.

## MATERIALS AND METHODS

The isolation and virulence of the New York City (NYC) strain of rabies virus for animals has been described.<sup>3</sup> A frozen 20 per cent suspension of canine salivary gland (R-163) tissue,\*\* representing the NYC strain of virus, was thawed and centrifuged at 1,000 r.p.m. for five minutes. The supernatant fluid was removed, mixed with an equal volume of distilled water, titrated in mice, and inoculated into 3 farm-raised dogs. One-tenth milliliter of the 10 per cent virus suspension was injected bilaterally into the masseter muscles of

gland suspension had a virus titer<sup>4</sup> of 100,000 l.d.<sub>50</sub> in 25- to 28-day-old Swiss Albino mice.

The 3 dogs developed "furious" rabies 15, 17, and 19 days after inoculation. When they were moribund, the salivary glands were excised and a piece of each gland was removed for titration while the remainder was frozen at -70 C. The pieces of glands were individually made into a 10 per cent suspension, by weight, in distilled water with 10 per cent horse serum, centrifuged, and titered in 25- to 28-day-old mice.

Those salivary glands exceeding 32,000 l.d.<sub>50</sub> per 0.03 ml. were pooled and adjusted to a 20 per cent suspension by weight in distilled water. The glands with diluent were ground for ten minutes in a Waring blender surrounded by an ice jacket. The pooled salivary gland suspension was distributed in 2-ml. amounts in glass vials, shell frozen in an alcohol-CO<sub>2</sub> bath, and stored at -70 C. until used.

This pool of virus was shown to be highly infectious for dogs. The masseter muscles of 19 dogs were inoculated bilaterally with salivary gland suspension diluted to 10 per cent, 0.1 ml. of virus in each muscle. Of the 19 dogs, 15 developed rabies and were dead by the thirtieth day. This pool of virus served as inoculum for the next experiments.

One vial of virus was thawed and opened. The contents were mixed with an equal volume of distilled water and centrifuged at 1,000 r.p.m. for five minutes. From the supernatant fluid, ten- and twofold dilutions of virus were prepared in distilled water with 10 per cent horse serum. The serial tenfold dilutions, titered intracerebrally in mice, contained 399,000 l.d.<sub>50</sub> per 0.03 ml.

Dilutions of 1:10, 1:20, 1:40, 1:80, and 1:100 each were injected into 8 Hartley guinea pigs each weighing 400 to 450 Gm. Each guinea pig was given 0.1 ml. of the desired virus dilution intramuscularly in the right hindleg and the day of paralysis and of death was recorded (table 1).

## RESULTS

Of the 8 guinea pigs injected with a 1:100 dilution of rabies virus, 2 survived without showing signs of rabies, while the other 6 showed paralytic rabies and died by the nineteenth day. The remaining 32 guinea pigs injected with decreasing dilutions of rabies virus had paralytic rabies



Fig. 1—Residual rabies paralysis in a guinea pig three months after injection of the virus.

each dog. Each mouse was given 0.03 ml. of the desired virus dilution. Five mice were used for each dilution. Results showed that the salivary

Mr. Bolin is with the U.S. Public Health Service, CDC-Phoenix Field Station, 706 East Adams St., Phoenix.

The author thanks Dr. Earl Mundel, Kansas City, Mo., for taking the photograph of the guinea pig.

\*Obtained from Dr. Hilary Koprowski, Lederle Laboratories.

TABLE 1—Results of Intramuscular Titration of New York City Rabies Virus in 40 Guinea Pigs

	Virus dilutions*														
	10			20			40			80			100		
Day of paralysis	10/9,	11/9,	12/9	10/9,	13/10,	14/10	12/9,	13/10,	14/11	12/9,	13/9,	13/11	13/9,	15/12,	15/14
and	12/11,	12/11,	13/12	15/11,	16/11,	17/11	15/11,	15/12,	15/12	13/12,	15/12,	16/12	17/14,	19/14,	19/17
death**	15/14,	15/14		17/15,	17/15		15/12,	5/12		17/14,	17/15		SS		

\*Numbers are reciprocals of virus dilutions; \*\*denominator=day of onset of paralysis, numerator=day of death; S/12=paralysis developed on the twelfth day and the guinea pig survived rabies virus infection; S=survived.

between the ninth and seventeenth days. Some of the guinea pigs were more easily excited by noise and movements before paralysis developed.

Of the 32 paralyzed guinea pigs, all died except 1. This animal was given a 1:40 dilution of rabies virus, i.m., in the right hindleg. Paralysis appeared first in the right leg 12 days after inoculation and, by the fourteenth day, the left hindleg was paralyzed. The bilateral flaccid paralysis persisted for 30 days. At this time, the motor function of the left leg began to return, permitting the animal to use the leg in walking but with noticeable dragging. During the next six weeks, there was continued improvement in the left paralyzed leg but some limping when the animal walked.

The motor functions of the right leg were alienated from the nervous system (fig. 1) since walking procedures never returned to normal. The eating and drink-

ing habits of the guinea pig remained essentially normal during the three-month observation period.

It was then exsanguinated and the serum was used for neutralization studies. Ten per cent suspensions of its lumbar spinal cord, medulla, basal ganglia, and hippocampal gyri were prepared in distilled water and injected intracerebrally into mice. Five mice were used for each of four tests. None of the 20 mice injected died during a 21-day observation period.

The data (table 2) clearly demonstrate that this guinea pig suffered a paralytic attack of rabies coupled with the subsequent development of specific neutralizing antibodies.

#### SUMMARY

Of 40 guinea pigs inoculated with street rabies virus, 37 died and 3 survived. One of the 3 developed paralytic rabies which did not prove to be fatal. Specific serum neu-

TABLE 2—Results of the Neutralization of Street Rabies Virus with Convalescent Serum from a Guinea Pig that Recovered from Rabies

Source	Serum Final dilution	Final virus dilutions*						Virus (i.d. 30 titer)	Index** of serum neutralization
		1	2	3	4	5	6		
Normal guinea pig	1:5	ND†	ND	5/5‡	5/5	1/5	0/5	10 <sup>-5.00</sup>	2.5
Paralyzed guinea pig	1:5	3/5	0/5	0/5	1/5	0/5	ND	10 <sup>-1.00</sup>	10,000
Hyper-immune §	1:10	ND	0/5	1/5	0/5	0/5	ND	< 10 <sup>-2.0</sup>	> 1,000
Virus only	—	ND	ND	5/5	5/5	2/5	1/5	10 <sup>-5.0</sup>	—

\*Reciprocal of final virus dilution in each serum virus mixture—serum virus mixtures were incubated at room temperature for two hours, each mouse received 0.03 ml. of the desired mixture intracerebrally; \*\*the antilog of the differences of the virus titers is the neutralization index in infectious doses of virus neutralized by serum; †ND—not done; ‡numerator=no. of mice dead, denominator=no. of mice used in test; §Lederle, No. 1648-53 concentrated rabies hyperimmune serum—guinea pig serum inactivated at 56 C. for 30 min.

tralizing antibodies against street rabies virus were demonstrated in its serum three months after infection.

#### References

- <sup>1</sup>Enright, J. B.: Bats, the Relation to Rabies. *Ann. Rev. Microbiol.*, 10, (1956): 369.  
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<sup>3</sup>Koprowski, H., and Cox, H.: Studies on Chick Embryo Adapted Rabies Virus. I. Culture Characteristics and Pathogenicity. *J. Immunol.*, 60, (1948): 533.  
<sup>4</sup>Reed, L. J., and Muench, H. A.: A Simple Method of Estimating Fifty Percent End-Points. *Am. J. Hyg.*, 27, (1938): 493-497.

### Induced Rabies in Hamsters, Guinea Pigs, and Mice

When inoculated intramuscularly with street virus, guinea pigs were the most susceptible and mice the least, with hamsters intermediate. The younger the hamsters, the more susceptible they were to rabies.

The virus was recovered from the submaxillary glands of about half of the mice and hamsters which died of the infection. In hamsters, the incubation period was relatively short and the course of the disease was prolonged; in guinea pigs, the incubation period was longer and the course shorter; mice were intermediate.

Hamsters usually manifested the furious form in the early stage of infection, but mice and guinea pigs showed nothing but the dumb form.—*NIBS Bull. Biol. Res. (Tokyo)*, 2, 1957: 32.

### The Role of Bats in Rabies in Europe

Rabies has been identified in the native insect-eating bats in Hamburg, Germany, and in Yugoslavia. The virus was occasionally found in their salivary glands.

These bats, which have little contact with other species, presumably transmit the infection to them only during the relatively short stage of excitation. Unlike similar bats in North America, these have no chance of coming in contact with infected blood-licking (vampire) bats.

Epidemiologically, the disease in Europe progresses uniformly whereas, if bats were responsible, it would occur sporadically and in scattered areas. However, these bats are well suited to serve as

reservoirs for the virus during periods when the area is free of clinical evidence of rabies.—*R. Schindler and H. K. Dennig in Monatsh. f. Tierheilk.*, 10, (1958): 169-177.

*Newcastle Disease Virus from Cow with Shipping Fever.*—In November, 1953, when 41 of 2,515 recently weaned calves in Wyoming had died of shipping fever, lung tissue from 1 calf was cultured for possible viral agents. The agent recovered killed embryonated chicken eggs and was not distinguishable from Newcastle disease virus.

After eight egg embryo passages, when inoculated into chicks, those 1 day old showed a loss of appetite, stupor, and prostration, but neither respiratory nor nervous signs, while those 3 days or older showed no signs of abnormality. Both adult and young chickens developed protective antibodies against NVD when inoculated with this agent.

However, no signs of illness developed in cattle, rabbits, mice, and guinea pigs when inoculated, indicating that this agent alone did not cause disease.—*Y. Ozawa and T. L. Chow in Poult. Sci. (July, 1958): 802.*

### Acute Heart Disease of Swine

In Denmark, muscle degeneration was observed at slaughter in swine with acute heart disease. The disease is attributed to hormone imbalance, usually a reduced thyroid activity, and an insufficiency of the suprarenal gland. However, muscle degeneration was also found accompanying increased activity of the growth hormone. It was considered a genetic problem, but with nutrition also playing an important role.—*J. B. Ludvigsen in Arch. f. exptl. Vet-med.*, 11, (1957): 198.

Heart death occurred in many swine in small herds but not in 30 large herds, nor where only 1 or 2 pigs were raised. It might be considered a sodium chloride deficiency since the potassium levels of the blood are raised and the sodium levels lowered. The large herds of swine are usually fed salt containing fish meal and the smallest groups are usually fed salt containing kitchen leftovers.

In a test with 100 pigs, when sodium chloride was removed from the feed without other changes, 8 pigs died suddenly within three days while only 1 of the group given salt died. On a farm where heart



death was formerly frequent, no deaths occurred in 18 months after small quantities of sodium chloride were added to the feed.—P. Behn in *Monatsh. f. Vet.-med.*, 2, (1956): 560.

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That heart death might be due to an albumin deficiency was suggested when typical cases were found in a herd which was not fed animal albumins. Two pigs in which the albumin blood level was low recovered when they were fed fish meal for several weeks while the other affected pigs died.—H. K. Englert and C. Kopp in *Ztschr. f. Tierer. u. Futtermit.*, 12, (1957): 197 (abstr. in *Die Vet. med. II*, (1958)).

Red Angus cattle will, for the first time, have a class of their own at the 1959 Southwestern Exposition and Fat Stock Show at Fort Worth, Texas.—*The Cattleman* (Nov., 1958): 102.

*Klebsiella Pneumonia in a Dog.*—A cattle dog, 2 years old, worked well in the morning but was ill in the afternoon with a temperature of 103.4 F. and signs of consolidation of the right lung. The next morning, his temperature was 104.6 F. and there was free blood in the feces. He died within 24 hours and at necropsy many *Ancylostoma caninum* were found on the mucous membrane of the small intestine, the lumen of which was filled with blood. *Klebsiella pneumoniae* was isolated from the lungs. Death was due to the pneumonia.—*Austral. Vet. J.* (Aug., 1958): 253.

### Treatment of Bovine Coccidiosis

In the summer of 1957, in the Italian Alps, coccidiosis due to *Eimeria zürnii* became a serious problem in two herds consisting of 460 Brown Swiss cattle. Of 12 treated with ammonium sulfate (4 Gm./100 kg. body weight in a liter of milk twice a day for 4 days), 9 recovered in three to five days; 1 with an advanced case died in ten days; and 2 showed no improvement until treated with sulfonamides.

Rapid recovery occurred in all of 25 given either sulfaguanidine (200 mg./kg. 1 day, then 150 mg./kg. for 3 days), sulfamethazine (160 mg./kg. for 3 days, then 80 mg./kg. for 3 days), or a sulfonamide mixture for four days.

Of 5 given tetracycline *per os* (12 mg./

kg. for 3 days), 2 recovered but diarrhea continued in 3 although oocysts and blood disappeared from the feces. These recovered promptly when treated with sulfonamides. Two untreated control animals died.—G. Gasparini et al. in *Vet. Rec.* (Sept. 27, 1958): 787.

*Antibiotics in Semen Following Intramuscular Injection.*—As a supplement to the addition of antibiotics to diluted semen of bulls, it was thought antibiotics injected intramuscularly might be useful. Therefore, either penicillin (6 to 12 million I.U.), streptomycin (10 Gm.), or oxytetracycline (5 mg.) was injected into each of 18 bulls representing six breeds.

When tested by the paper-disc plate method, penicillin at the lower levels was effective for six hours, and at the higher levels for 18 hours; streptomycin was not therapeutically effective; and oxytetracycline was effective against most sensitive organisms for 30 hours.—T. R. Barr in *Canad. J. Comp. Med.* (Sept., 1958): 297.

*A Litter of Pigs Weighs a Ton at 85 Days of Age.*—A Landrace sow, in Missouri, farrowed 21 pigs in her third litter, and raised 20 which weighed a total of 1,222 lb. at 56 days of age and 2,000 lb. at 85 days. The previous record was set at 99 days, early in 1958, by the litter of a cross-bred sow in Indiana. The litter of the Missouri sow was divided, at birth, into two groups of 10 pigs. For the first five days, the groups were left with the sow alternately for four hours, then one group was left with her at night, the other group during the day. All were weaned at 4 weeks. In her first litter, this sow farrowed and weaned 13 pigs, and in her second litter, farrowed 15 and raised 14.—*Nat. Hog Farmer* (Oct., 1958): 22.

*Cross Immunity Between Canine Distemper and Rinderpest.*—The existence of cross immunity between distemper in the ferret and rinderpest in cattle has been confirmed. It is believed that if a minimum immunizing dose of Carré virus can be established and if it can be produced in abundance as a virulent vaccine, it might serve as a sure and safe agent for immunizing against rinderpest.—P. Goret in *Off. internat. des Epizoot.* (Aug., 1958): 501.

## Rabies—Postexposure Treatment of Animals

There are still some physicians who, confronted with a patient just bitten by a dog, would promptly treat the wound with fuming nitric acid and proceed to give a series of Semple-type vaccinations. Physicians who are aware of the more modern approach would probably clean the wound with soap and water and then consider the significance of the location of the bite, time lapse between bite and treatment, previous postexposure treatment of the patient, and the status of the offending animal. He then would decide which of the available commercial products (anti-rabies serum, Semple-type vaccine, duck embryo vaccine) to use in treatment.

Veterinarians as a group are probably better informed about rabies than practicing physicians because it is essentially a disease of the canine species. However, postexposure treatment of animals, usually pets, is a service many have never been asked to perform and, therefore, have given it no thought. The point is that neither the physician nor the veterinarian would have to make hasty decisions regarding postexposure treatment if he has given some thought to the problem beforehand.

### PROCEDURE WITH EXPOSED ANIMALS

When a valued dog has been exposed to rabies, the owner turns for advice to the veterinarian, who can suggest several possible courses of action, keeping in mind the long incubation period and the grave danger if postexposure treatment of the dog fails. Because the alternatives are not infallible, the wisest advice is euthanasia.

The alternatives that could be suggested are: (1) Confine the dog in strict isolation for at least six months; (2) if the dog has been vaccinated within the past year with nervous tissue vaccine or within the past three years with chicken embryo vaccine, revaccinate and restrain for 30 days; (3) if the dog has not been vaccinated within one year with nervous tissue vaccine or within three years with chicken embryo vaccine, confine it in strict isolation for three months and give postexposure treatment.

When anti-rabies hyperimmune serum is used for postexposure treatment, it should be used within 72 hours after exposure. It should be followed within the next seven days with a single dose of chicken embryo

vaccine or else a course of nervous tissue vaccine.

In those cases where the dog had been previously vaccinated within the prescribed time by a competent person, postexposure treatment may be justified and reasonably safe. However, if there was no such previous vaccination, the veterinarian may be justified in using considerable persuasion in connection with his recommendation for euthanasia.

One dog developed rabies 96 days after being bitten by a rabid raccoon despite a 14-day course of treatment with phenolized rabies vaccine that was started on the third day after exposure (see JOURNAL, Nov. 1, 1956: 438). As a result, two persons were heavily exposed to the saliva and had to be given Semple-type vaccine. For one of them, it was the second series of such treatment and the severe reaction caused concern for her recovery. Mindful of the hazard to human life in the event that postexposure treatment of the dog fails, the veterinarian who treated this dog against his better judgment was thereafter more persuasive in his arguments for euthanasia.

### Let's Stay in Our Own Field

Veterinarians often receive telephone calls from persons whose children or friends have been bitten by animals. Most of these people know just enough about rabies to be excited. They may be too disturbed to understand the advice given by telephone no matter how good it may be.

Certainly no one is better qualified than the veterinarian to recommend what to do about the offending animal. His advice pertaining to capture, confinement, observation, and perhaps eventual preparation of the head for laboratory examination should be given promptly in the spirit of public service. However, many of these people are seeking information about the treatment and protection of the victim, and it is here that the veterinarian should tactfully refer the caller to a physician.

Otherwise, if the physician's decision on treatment of the victim seems to conflict with the advice of the veterinarian, the patient will be displeased with one or the other and intraprofessional relations may suffer.

## ABSTRACTS

### Typing Vesicular Stomatitis Viruses

A simple complement-fixation test which is reliable for the differential diagnosis and typing of vesicular stomatitis and foot-and-mouth disease was described in detail. Charts described the titrations of the reagents and summarized the results obtained from 95 known and 170 unknown antigens.—[E. W. Jenney, L. O. Mott, and Erich Traub: *Serological Studies with the Virus of Vesicular Stomatitis. I. Typing of Vesicular Stomatitis Viruses by Complement Fixation. Am. J. Vet. Res.*, 19, (Oct., 1958): 993-998.]

## FOREIGN ABSTRACTS

### Soviet Hog Cholera Vaccines

Swine-feeding farms have been troubled by outbreaks of atypical cholera after repeated vaccination with glycerinized crystal violet vaccine. In a series of experiments with 34 swine, vaccination with crystal violet vaccine repeated in two weeks failed to protect against 1 ml. of Dorset virus intramuscularly or against natural infection. Lapinized virus alone or lapinized virus with anti-hog cholera serum were somewhat more effective.

Double crystal violet vaccination followed within one month by dried lapinized virus afforded the best protection. This method was employed to immunize 20,000 swine, with good results.—[T. Y. Sergeyeva and V. J. Popov, *Scientific-Production Lab. Ministry of Agriculture, R.S.F.S.R.*, and G. A. Simonyan, *Ramenskoye State Farm: On Specific Prophylaxis of Hog Cholera. Veterinariya*, 35, (Oct., 1958): 38-43.]—ROBERT E. HABEL.

### Vaccination of Sheep with Strain 19

A state farm in the Uzbek, S.S.R., had been infected with brucellosis since 1932. In each of the three years before vaccination, 600 to 800 sheep had reacted to the allergic test, and mass abortions had occurred. In July, 1955, two months before the breeding season, all nonreactors were vaccinated subcutaneously with strain 19. A dose of 1/5, 1/3, or 1/2 the bovine dose was employed in different flocks, but the results showed no difference in immunity attributable to dosage. A total of 35,000 sheep were vaccinated, of which 26,000 were ewes.

Thirty days later, 1,102 sheep were tested by agglutination and complement fixation, revealing 93 and 95 per cent positive reactions, respectively. Of 627 allergic tests given 45 days after vaccination, 23 per cent were positive.

Abortions were reduced from 418 the previous year to 203 in 1956. Whereas *Brucella* was cultured from 34 of 56 aborted fetuses in 1955, the organism was found in only 3 of 82 fetuses cultured in 1956. The number of barren ewes in-

creased from 658 in 1955 to 1,015 in 1956, but this was attributed by the authors to bad weather and poor nutrition during the breeding season.

Vaccination was repeated before the breeding season of 1956. Of the 100,974 sheep vaccinated, 27,194 were ewes. In 1957, *Brucella* was isolated from 1 of 82 aborted fetuses cultured. In both years, all of the *Brucella* cultures obtained were identified as *Brucella melitensis*; none were strain 19. Two years after the second vaccination, 1.8 per cent of the sheep gave a positive agglutination reaction and 1.6 per cent a positive complement-fixation reaction.

Of 520 yearlings left unvaccinated and distributed among the vaccinated flocks, 11 reacted positively to agglutination and complement-fixation tests. Five of these were slaughtered, but *Brucella* could not be cultured from them.

In a flock of 700 ewes, vaccinated twice in the same year—before and after the breeding season, there were no abortions caused by *Brucella*.

Of 805 reactors vaccinated, 32 developed local swelling, slight fever and depression lasting one to four days. After 11 months, 59 per cent were negative to agglutination and complement-fixation tests.

The authors concluded that, after two years of vaccination, the number of abortions caused by *Brucella* was greatly reduced, but the disease was not eradicated.—[N. V. Sofronov, *Uzbek Vet. Res. Inst.*, and N. N. Novaev, *Chief Vet., Ulus State Farm: Our Experience in the Vaccination of Sheep with Strain 19. Veterinariya*, 35, (Oct., 1958): 28-31.]—ROBERT E. HABEL.

## BOOKS AND REPORTS

### Animal Ecology Today

A careful perusal of this book might be expected to strengthen the veterinarian's position as an important and integral part of animal husbandry, and especially to add depth to his training as a natural scientist.

In keeping with this idea, the author states: "It is the privilege of the scientist to be right, but to wish further the discovery of truth, if it be in his agreement or in contradiction to his earlier opinion."

In the chapter "Why Human Ecology?" the author expresses his views as follows: "It is the tragedy of modern man that the rapid development of agricultural science has induced an avalanche-like increase of soil destruction by intensive, unwise soil exploitation, because no consideration was given to the permanent protection of soil and vegetation. Man's drive to utilize the day and to exploit the possible benefits of the moment without adequate heed to the future productivity of the soil may ultimately lead to his destruction. The demographic problem of human fertility in a world which grows more unfavorable for human survival is largely one of human behavior."

The author holds that "... ecology is needed for a proper understanding of man's greatest prob-

lems. And that is why no other science is at this moment more important for mankind's future than that of human ecology and the solution of its pressing problems."—[*Animal Ecology Today*. By F. S. Bodenheimer. 276 pages; illustrated. Dr. W. Junk, Publishers, 13, Van Stolkweg, The Hague, Netherlands, 1958. Price \$7.50.]—H. E. KINGMAN, Sr.

### The Diagnosis and Treatment of Infections

This book deals entirely with diseases in man and their chemotherapeutic control. The author has been trained in both laboratory bacteriology and clinical medicine. His object in writing the book is "to synthesize these two disciplines for the student and practitioner and for the mutual benefit of clinician and laboratory worker."

The material in parts 1 and 2 is an up-to-date condensation of material generally available in literature. Part 3 is a brief discussion of the nature, cause, and treatment of a variety of clinical conditions occurring frequently in man. The author offers, in a commendable style, his own concise version of each condition. Although there is invariably some divergence of opinion in clinical matters, the author has a sound and rational approach to those conditions familiar to this reviewer.

The author has presented a large amount of information in a small, well-organized volume. The feature which will appeal most to the student and the busy medical practitioner is the generous use of tables (25) to summarize drugs available, dosages, toxicities, routes of administration, information on inclusion bodies, differential diagnosis of virus and aspiration pneumonia, helminth infections, and several other topics.

This book will provide a ready reference for the basic scientist and the veterinary experimentalist searching for information on the characteristics of the common chemotherapeutic agents in current use.—[*The Diagnosis and Treatment of Infections*. By G. James. 234 pages. Charles C Thomas, 301 E. Lawrence Ave., Springfield, Ill., 1957. Price \$6.00.]—L. MEYER JONES.

### The Year Book of Cancer

The 124 contributing editors for this book are eminent representatives of the various disciplines of medicine. Consequently, one may be reasonably sure that they are familiar with any important article relating to their own work, regardless of the language in which it appears. However, there is a disproportionate abundance of references in the English language, especially from the American literature.

The stated purpose of this book "is to provide the reader with concise abstracts of the more significant articles in the broad field of oncology which appeared during the preceding year." The material is presented under 25 broad headings based on both anatomic groupings and special disciplines plus a special article, "Oncology in the Soviet Union."

There is a section designated "General Animal Tumors" but it is devoted to experimental oncology as related to small laboratory animals. Thus, while its stated purpose is achieved commendably with regard to human medicine, the broad field of veterinary medicine is ignored. Surely, knowledge of spontaneous tumors of animals, including the domestic species, is a contributing portion of the broad field of oncology.

This work will probably be of limited interest to the average veterinarian but should be of value to veterinary pathologists, especially those interested in oncology. It will serve as a convenient source to general references in the field. Since the broad principles of oncology know no species limitations, information on classification, behavior, epidemiology, and therapy, including surgery, radiotherapy, and chemotherapy, might be of value to the veterinary practitioner.

The editors and editorial board deserve much credit for a difficult job well done. Much information is presented clearly and concisely. The paper is good, the type pleasing, and the reproduction of illustrations clear.—[*The Year Book of Cancer (1957-1958 Year Book Series)*. By R. L. Clark, Jr., and R. W. Cumley, editors. 523 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price \$8.00.]—CHARLIE N. BARRON.

### Comparative Aspects of Haemolytic Disease of the Newborn

The author of "The Rhesus Factor" has performed an excellent service in bringing together and recording the present knowledge regarding hemolytic disease of the newborn. He discusses the disease in man, the horse, mule, and pig, as well as the experimental production of hemolytic disease in the guinea pig, rat, dog, and rabbit.

About one third of the text is devoted to the disease in man, and veterinarians may feel that sufficient emphasis is not given to the condition in domestic animals. This is not the case, for the historical aspects and iso-immunization as well as the clinical, hematological, and serological aspects of the natural disease in domestic animals are thoroughly detailed. There is also a chapter in which is described the passage of antibody to the young, the effect of the antibody, and the manifestation of hemolytic disease in different species.

With respect to nomenclature, the author states that "haemolytic disease of the newborn" is preferred to "erythroblastosis foetalis." I much prefer the designation "neonatal isoerythrolysis." It adequately describes the disease as seen in the horse, mule, and pig and is in common usage in many places.

This book should be of interest to veterinarians and an essential guide for the student of animal diseases.—[*Comparative Aspects of Haemolytic Disease of the Newborn*. By G. Fulton Roberts. 199 pages. William Heinemann, Medical Books, Ltd., London. 1957. Price \$3.00.]—D. W. BRUNER.



# THE NEWS

## Veterinary Symposium to Be Held in Israel Next May

A veterinary symposium will be held in Israel, May 10-12, 1959, as one of the scientific meetings which will follow the Farmers Convention to be held in that country next spring. Two days of lectures by worldwide and Israeli veterinary authorities on problems such as foot-and-mouth disease, tick-borne, poultry diseases, leptospirosis, and rabies, will be given at the new Israeli Veterinary Institute, the dedication of which will take place at Beit-Dagan.

An organization, American Veterinarians for Israel, of which Dr. Salo Jonas, New Haven, Conn., is president, is sponsoring group travel to Israel early in May for the various events there, including plans for the group to leave Israel by air for Madrid in time to attend the XVIth International Veterinary Congress, plus post Congress visits to Paris and London.

Full particulars can be obtained by writing to Dr. H. E. Newman, American Veterinarians for Israel, Box 145, Merrifield, Va.

## Dr. Baker Globe Trots in Survey of Monkeys for The National Foundation

On an eight-month sabbatical leave from Cornell University to study the health hazards of monkeys used in the testing and production of Salk polio vaccine for The National Foundation, Dr. Donald W. Baker (COR '29) visited England, Germany, Greece, India, Thailand, and the Philippines. He spent most of his time on Mindanao in the Philippines exploring the jungles from which the United States has received over 300,000 monkeys for use in polio prevention in the last three to four years.

In conducting similar studies, Dr. Baker has made three previous trips to India, which has been our principal source of supply until difficulties arose in securing the monkeys from there. Since South American monkeys are not considered suitable for use in the testing and production of Salk vaccine, the Philippines have become the United States' chief supplier.

While these monkeys are almost phenomenally healthy in their natural habitat and with few enemies (snakes and eagles), they encounter many environmental changes in their 9,000 mile trip from the islands to the states. Dr. Baker's findings will be used to prevent monkey-fatality en route from the jungle to the laboratory. In addition, his report will show that the islands are capable of continuing to

supply the United States' demand for them unless something unforeseeable should occur in the future. Dr. Baker will return to Cornell at the end of this month.

The official name of the National Foundation for Infantile Paralysis, Inc., was changed to The National Foundation in ceremonies held in New York City, July 22, 1958.

## Dr. Agnes Sjöberg Pioneered Veterinary Medicine for Women in Europe

Born in Kauhajoki, Finland, in November, 1888, Dr. Sjöberg, Europe's first woman veterinarian, was fascinated by the practice of veterinary medicine as a child, and overcame the stubborn opposition against acceptance of women students in the field of veterinary medicine to be admitted to the College of Veterinary Medicine at Dresden in 1911.

Dr. Sjöberg's excellent scholastic record from the College at Dresden allowed her to continue her education as the first woman student at the College of Veterinary Medicine in Berlin. When she was ready to take the examinations for her B.V.Sc. degree, permission was needed from the Cabinet of Prussia. After an interval of several months, the government gave its consent. This paved the way for other women students to take examinations in veterinary medicine.

After practicing in different clinics in Berlin's College of Veterinary Medicine, from 1914 to 1917, Dr. Sjöberg moved to Neubrandenburg



Dr. Agnes Sjöberg

as an assistant to Dr. Otto in 1917, in order to learn about country practice. Later, in July, 1918, she became the first woman in Europe to obtain a D.V.M. degree from the University of Leipzig.

In August, 1918, Dr. Sjöberg returned to Finland where she has remained for 40 years as a large animal practitioner and a lecturer in schools of agriculture and cattle breeding. She has also published several works on various subjects and is a subscriber to the JOURNAL.



## Meeting of American College of Veterinary Toxicologists

Featured on the Jan. 21, 1959, program of the American College of Veterinary Toxicologists will be nationally recognized speakers on a variety of subjects embracing the broad field of veterinary toxicology. Preliminary arrangements include: morning work sessions of the committee and council, with the afternoon devoted to scientific papers.

This year's session will be held, as before, at the Hotel Utah in Salt Lake City, beginning at 10:00 a.m. and continuing until about 5:30 p.m. on the day preceding the meeting of the Intermountain V.M.A. Dr. H. E. Furgeson of Anaconda, Mont., president, invites all interested veterinarians to attend the afternoon scientific program. Dr. A. M. Lee, of Beltsville, Maryland, vice-president and program chairman, promises six outstanding technical discourses.

The College's main objective is the advancement of educational and scientific progress in the field of veterinary toxicology.

## Correction—Nutrition Meeting

In reporting the meeting of the American Association of Veterinary Nutritionists held in Philadelphia on Aug. 18, 1958, two errors were made (see the JOURNAL, Oct. 15, 1958, p. 415).

It should have been reported that Dr. R. E. Nichols (instead of Dr. T. J. Jones) "reported on two meetings with members of the research council of the American Feed Manufacturers Association and on a poll of the Veterinary Colleges which revealed that only two offer formal courses in animal nutrition." Dr. Jones is the group's chairman of the Publications committee and he reported on papers written under the encouragement of his committee and submitted for publication.

In addition, "Upon accepting the gavel, Dr. Cunkelman, incoming president, discussed 'Where Are We Now and Where Are We Going?'"

## AMONG THE STATES AND PROVINCES

### Illinois

**Northern Illinois Association.**—The 125 members of the Northern Illinois V.M.A. who met for the association's annual convention at the Faust Hotel, Rockford, on Sept. 17, 1958, elected the following roster of officers: Drs. J. G. Hardenbergh, Rockton, president; D. W. Rawson, Milledgeville, president-elect; C. H. Larson, Shabbona, secretary-treasurer; J. M. Nelson, DeKalb, and William Gay, Woodstock, executive board members.

A total of eight talks were presented by a cross-section of speakers from five states. Dr. B. L. Lake, of Rockford, was in charge of local arrangements.

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**State Association.**—Dr. Donald Wheeler, Peoria, guided the local arrangements for the Nutrition Conference for Veterinarians of the Illinois State V.M.A. held at the Pabst Brewing Company Auditorium in Peoria Heights, Nov. 19, 1958.

Representing the Illinois State V.M.A. were: Drs. Morris Erdheim, Chicago; Mark Davenport, LaGrange; Vernon Dvorak, Wilmette; Lester Fisher, Berwyn; and Don Wheeler. Attending for the Illinois Feed Association were: Messrs. Alvin Lovekamp, New Berlin; Dexter Obenhaus, Princeton; Cy Sievert, Chicago; Dean Clark, Chicago; and Carl Rylander, Waterman.

Principally, the nutrition factors of cattle, swine, and dogs were stressed.

### Iowa

**East Central Society.**—At the October, 1958, meeting of the East Central Iowa V.M.S., the following officers were elected: Drs. K. H. Randolph, Lost Nation, president; J. G. Irwin, Iowa City, vice-president; and T. F. Bartley, Box 454, Cedar Rapids, secretary-treasurer.

In addition, the society voted to change the regularly scheduled meeting date from the second Thursday to the third Thursday of each month.

s/T.F. BARTLEY, Secretary-Treasurer.

### Kansas

**K.S.C. Meats Now Bear the Sunflower Seal.**—

A program of state inspection of slaughtering and processing of meats has recently been instituted in the new meats laboratory of the animal husbandry building at Kansas State College, Manhattan.

The inspection program has a two-fold purpose: to guard the general safety of the meat consuming public purchasing meat products from the school laboratory; and to instruct veterinary students in inspection procedures and techniques used in commercial packing plants.

### Ohio

**Co-Ordinated Group Action.**—The Physician's Business Bureau, a member of the Medical-Dental Hospital Bureaus of America, Inc., is expanding its services to include all professional medical organizations and individual members of these organizations. These include the Registered Nurses' Association, the Cincinnati Veterinary Medical Association and the Cincinnati Pharmaceutical Association.

Announced through the Academy of Medicine in this city, the member groups of the Academy were invited to assist in maintaining a central office and to perform the non-medical functions of professional men and women. These functions include telephone answering, credit checking, collections, budgeting, personnel placement, and professional management.

Through this central business office, the professional organizations and their members can quickly dispose of routine procedures, freeing more of their time to provide health services to the community.

Dr. J. Robert Hudson, president, Academy of Medicine of Cincinnati, and Dr. A. G. Madden of the Cincinnati V.M.A. were pioneers in crusading for co-ordination among medical groups.

### Pennsylvania

**Bucks-Montgomery Association.**—The following officers of the Bucks-Montgomery V.M.A. were elected November 12, in Doylestown: Drs. Cameron S. Wilson, Richboro, president; Fred R. Guenther, Newtown, vice-president; M. J. Deubler, Newtown, secretary-treasurer. Delegate to the Pennsylvania State V.M.A. is Dr. Alan S. Vansant, Hollywood; alternate is Dr. D. M. Hopkins, Hatfield.

One of Dr. Wilson's first acts as president was to appoint a public relations committee composed of: Drs. M. J. Deubler, chairman; E. W. Holden, Norristown, Alfred Kissileff, Flourtown; and E. D. Tuckerman, Plymouth Meeting.

s/M. J. DEUBLER, *Secretary*.

### West Virginia

**State Association.**—Dr. John J. Spanabel chairmanned the committee on local arrangements for the fall meeting of the West Virginia V.M.A. at the Hotel Fairmont in Fairmont, Oct. 12-13, 1958.

Among the speakers at the meeting were: Drs. Franklin Custer, Oakland, Md.; Charles Diesem, Ohio State University; John Hanover, Forest Park, Ill.; and William E. Trussell, Charles Town. Plaques for long and outstanding service to the state's livestock industry and veterinary profession were awarded to Dr. Charles Beall (TH '12), Morgantown, and to Dr. J. J. Cranwell (CVC '07), Fairmont, at a banquet held October 12.

Newly elected officers of the Association were: Drs. John Spanabel, Fairmont, president; William E. Trussell, Charles Town, president-elect; Harry J. Fallon, Huntington, secretary-treasurer; and Gordon Phillips, Charleston, J.O. Heishman, Wardenville, and James Moore, Jr., Point Pleasant, members of the Executive board.

s/HARRY J. FALLON, *Secretary-Treasurer*.

### Wyoming

**Dr. Ketcham, A Civic Leader.**—Dr. J. E. Ketcham (COL '40), a general practitioner in Cheyenne, has recently been elected president of the Wyoming Society for Crippled Children and Adults, Inc. He has been active in the Easter seal program for several years.

s/J. F. RYFF, *Secretary, Wyoming V.M.A.*

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## U.S. GOVERNMENT

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**Veterinary Personnel Changes.**—The following changes in the force of veterinarians in the U.S.D.A. are reported as of Sept. 30, Oct. 30, and Nov. 3, 4, 5, & 26, 1958.

### TRANSFERS

Haigazoun Arshagouni, from Detroit, Mich., to Los Angeles, Calif.

Ralph L. Bishop, from Omaha, Neb., to Wichita, Kan.  
Oliver T. Douglass, from Kinston, N. Car., to St. Louis, Mo.

Glover E. Flory, from Sacramento, Calif. to Indianapolis, Ind.

Frank G. Gillett, from Salem, Ore., to Chicago, Ill.  
John W. Howder, from Spokane, Wash., to Chicago, Ill.  
Klemens F. Johnson, from Kansas City, Kan. to Washington, D.C.

Hubert C. Johnstone, from San Juan, Puerto Rico, to San Diego, Calif.

Joseph O. Minnick, from Menominee, Mich., to Omaha, Neb.

Merrill D. Radioff, from San Diego, Calif., to Portal, N. Dak.

Thomas P. Sardone, from Chicago, Ill., to San Francisco, Calif.

Herbert Shear, from Springfield, Mass., to Philadelphia, Pa.

Jack W. Smartt, from Ogden, Utah, to New York, N. Y.

Seidel N. Stephens, from Oklahoma City, Okla., to Sioux City, Iowa.

George C. Stewart, from Phoenix, Ariz., to Fort Worth, Texas.

Albert W. Stichka, from Jacksonville, Fla., to San Francisco, Calif.

Robert K. Strickland, from Fort Worth, Texas, to Baltimore, Md.

George W. Tyson, from Phoenix, Ariz., to Dubuque, Iowa.

John Henry Woolsey, from St. Joseph, Mo., to Grenada, Miss.

Royce L. Younger, from Fort Worth, Texas, to Helena, Mont.

### RETIREMENTS

Robert J. Donohue, Toppennish, Wash.

Spencer K. Nelson, Boston, Mass.

Harry Seever, Fort Branch, Ind.

George W. Trubey, Detroit, Mich.

### DEATHS

Fred Gross, Omaha, Neb.

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## DEATHS

Star indicates member of AVMA

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★**Charles H. Clark** (ONT '90), 88, Lansing, Mich., one-time state veterinarian of Michigan, died on Aug. 23, 1957. Following graduation from the Ontario Veterinary College in 1890,

he entered private practice in Michigan (license No. 60), was appointed assistant state veterinarian in 1915, was made state veterinarian in 1930, and retired from that office in 1946.

Dr. Clark joined the AVMA in 1916 and became a life member in 1953. He is survived by one son.

★**S. E. Hershey** (QU '98, STJ '20), 86, Charleston, W. Va., died Nov. 25, 1958, after a long illness. He was a native of Hagerstown, Md., but attended the veterinary school at Queen's University, Kingstown, Ont., and later enrolled at St. Joseph Veterinary College, St. Joseph, Mo.

During the outbreak of foot-and-mouth disease in West Virginia in 1915, Dr. Hershey was in charge of quarantine and eradication measures in three of the state's counties. Always active in professional affairs, he was a charter member of the West Virginia V.M.A., served as its president for 14 years, and as its secretary for 16 years.

In 1940, he was awarded a plaque by the state association for his many years of dedication and service to the profession. He joined the AVMA in 1912 and was made a life member in 1954.

Both Dr. and Mrs. Hershey were also active in national veterinary medical association work; he was the state's first delegate to the AVMA House of Representatives and served in that capacity almost continuously from 1935 to 1952. Mrs. Hershey was a charter member of the Women's Auxiliary and served as its secretary for a number of years. She survives her husband.

**Lester Edward Jenkins** (CVC '17), 71, Minneapolis, Minn., died at the Rice Memorial Hospital on Sept. 27, 1958.

Born in Minneapolis, Dr. Jenkins spent his youth at Maple Lake and Monticello. He was a life member of the Minnesota V.M.S. Surviving are his widow, the former Florence Jones, and a sister.

★**Granville J. Miars** (OSU '31), 51, Jackson Center, Ohio, died in his home Oct. 6, 1958, after an extended illness.

Dr. Miars had practiced in Jackson Center for 27 years. Survivors include his widow, Cre-

tora Leininger Miars, five daughters, and a sister.

★**S. L. Morrow**, 82, a life-long resident of Anderson County, Texas, died Sept. 24, 1958, in a local hospital. He had retired from practice in May, 1957.

Survivors include his widow, a son, four daughters, and 13 grandchildren.

★**Herman Victor Persells** (KCV '12), 86, Jacksonville, Fla., a life member of the AVMA since 1956, died Oct. 19, 1958, in a local hospital.

Dr. Persells was born in Wisconsin and at an early age moved to the Wyoming Territory in a covered wagon. As a youth, he helped his father train ranch horses on a Sioux Indian Reservation in Twin Lakes, Iowa.

After graduation, Dr. Persells served with the Bureau of Animal Husbandry in disease eradication in the Dakota territories. In 1919, he accepted a teaching position in the School of Veterinary Medicine at the University of Georgia. Following this, Dr. Persells became a meat inspector in St. Louis, Mo.; a position he retained for 20 years.

Surviving Dr. Persells are his widow, Ida Dillon Persells, a son, and a daughter.

★**Ernest M. Roesner** (SF '14), 66, formerly of Grass Valley, Calif., and a veterinarian in the state Bureau of Meat Inspection since 1941, died in Oakdale Oct. 15, 1958. He was in Oakdale on a temporary assignment.

Prior to entering state service, he had practiced in the Grass Valley, Nevada County area. In addition to his widow, Dr. Roesner is survived by a son, two daughters, two brothers, and two sisters.

• • •

**Other Deaths Reported.**—The following deaths have been reported. The usual information for an obituary was not supplied.

Alva B. Davis (GA '22), 60, Donalsonville, Ga., died sometime in October, 1958.

Wayne H. Dean, 68, Elwood, Ind., died Oct. 13, 1958.

★James B. Wilson, Sr. (KCV '18), Saint Croix Falls, Wis., died July 21, 1958.

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1. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 2. Mosier, J. E.: Vet. Med. 52:445 (Sept.) 1957.

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Two views (below) of Madrid's DEL PRADO ART MUSEUM, which houses many of the masterpieces of Spanish art. The collection includes the major works of El Greco, Goya, Murillo, and Velasquez, as well as notable paintings of other European artists.



### WOMEN'S AUXILIARY

President—Mrs. E. A. Woelffer, 115 Woodland Lane, Oconomowoc, Wis.

Secretary—Mrs. A. W. Eivers, 1745 S. 13th St., Salem, Ore.

#### Auxiliary News Notes

During the next few months, many of our auxiliaries will hold their annual meetings in conjunction with the state and regional veterinary meetings. The accomplishments, news, and rosters of new officers from these meetings are gathered together and reported to all members of the AVMA Women's Auxiliary in the spring of each year. The *Auxiliary News* will be mailed April 1, 1959, to more than 7,000 women, a record membership.

We hope to make this edition the best one yet, so we are making a few suggestions to help you have your group well represented.

1) Delegate specifically to your secretary or public relations officer the job of taking notes during the meeting and writing a report to the *News* editor. Emphasize your project or theme of action for the year.

2) Pictures add greatly to every news story. Plan ahead with the veterinarian in your men's group who will handle their news and picture coverage. Arrange with him to have a news photographer at an appointed time to get a picture of the head table at your luncheon, the receiving line at your tea, your new officers in a group, your pet project in action—whatever you choose, and have the subjects ready for the camera. If a newspaper photographer takes the picture, the local editor will usually be glad to give you a glossy print. Send in the picture with your story, and a check for \$4.85 to cover the cost of making a cut.

3) The deadline is Feb. 15, 1959. Remember—your honor roll standing will gain a point by having an article in the *Auxiliary News*.

Finally, are you a member of the AVMA Women's Auxiliary? Please be sure that your dues for 1959 are paid so you will be on our mailing list. We'll come to visit you in the spring.

S/MRS. WAYNE H. RISER, Editor.

### STUDENT CHAPTER ACTIVITIES

#### Michigan State Student Chapter

New student chapter officers elected at the spring term were: James Buchanan, president-elect; Nelson Westmoreland, vice-president; Quentin Bosworth, secretary; Richard Dörner, sergeant at arms; and Robert Holmes, treasurer. Dr. Waldo Keller serves as faculty advisor.

Since the spring term of last year, we have had a wide variety of programs at our chapter meetings, including a report on the rabies vaccination program, large and small animal surgery movies, and a showing of slides of Scotland by a veter-

inary student who participated in a farm youth exchange. Brian Forster of headquarters office gave a talk on public relations, and our delegates of the AVMA and state V.M.A. conventions reported on those activities. At our next meeting, we will have Dr. Charles H. Coy, president of Michigan State V.M.A., talk on the status of the intern in Michigan veterinary practice.

Chapter members received rabies vaccinations under an experimental program, and a high percentage of the students obtained quite high titers from these injections.

We are taking part in the College Disaster Program as a part of our public relations work, which we are stressing heavily. The chapter entered a display in the all-college Activities Carnival, which won the first place trophy.

At the beginning of the spring term, a newsletter was initiated covering current news throughout the veterinary school, which is edited by veterinary students. This is in addition to the *M.S.U. Veterinarian*, which is published once each term.

A glee club has been formed with members from all four classes, and we are competing in the college intramural program. So far, we have had teams participating in softball and football, and plan to enter a basketball team this winter term.

Among other social activities, we sponsored our annual Medicine Ball, the spring picnic, and the Fall Frolic, which was a square dancing party.

S/QUENTIN W. BOSWORTH, secretary.

#### The Porpoise has "Sonar" Sense

The porpoise is supersensitive to sound and might be said to possess an echo-ranging or sonar system. They make occasional exploratory bursts of sound pulses, enabling them to detect and distinguish between the objects in the water, even in visible sheets of Plexiglas.

In 202 trials, a porpoise made no attempt to catch a fish which was behind glass. When 2 fish were offered, both visible but one behind the glass, the porpoise would sputter, then listen before attacking the right fish.—*Sci. News Letter* (Nov. 8, 1958): 294.

#### Excess of Oxygen Retards the Heart

When animals were anesthetized with barbiturate and the amount of oxygen in the air breathed was increased, carbon dioxide in the blood rose, and if administered too long, it resulted in cardiac arrest in apparently healthy hearts.—*Sci. News Letter* (Nov. 15, 1958): 313.

#### Prairie Dog May Become Extinct

The prairie dog, a plant eater, may join the growing list of extinct animals in about ten years. Grazing and cultivation of the land has been largely responsible for its declining population.—*Sci. News Letter* (Nov. 15, 1958): 311.



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## COMING MEETINGS

Notices of coming meetings must be received 30 days before date of publication.

American Animal Hospital Association. Fifth annual region two meeting. Atlanta Biltmore Hotel, Atlanta, Ga., Jan. 18-19, 1959. Dr. R. P. Knowles, 2101 N.W., 25th Ave., Miami 42, Fla.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Iowa, Jan. 20-22, 1959. F. B. Young, executive secretary.

Michigan State University. Thirty-sixth annual postgraduate conference for veterinarians. College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Jan. 21-22, 1959. W. W. Armistead, dean.

Intermountain Veterinary Medical Association. Annual convention. Hotel Utah, Salt Lake City, Jan. 22-24, 1959. Douglas R. McKelvie, correspondent.

Oklahoma Veterinary Medical Association. Annual meeting. Hotel Mayo, Tulsa, Jan. 25-27, 1959. Larma Bennett, 2805 S.W. 51st St., Oklahoma City, Okla., executive secretary.

Minnesota State Veterinary Medical Society. Annual meeting. Leamington Hotel, Minneapolis, Jan. 26-28, 1959. B.S. Pomeroy, University of Minnesota, College of Veterinary Medicine, St. Paul 1, Minn. secretary-treasurer.

Louisiana State University. Annual conference. Pleasant Hill, Louisiana State University Campus, Jan. 27-28, 1959. William T. Oglesby, correspondent.

Maryland State Veterinary Medical Association. Winter meeting. Emerson Hotel, Baltimore, Md., Jan. 27-28, 1959. Harry L. Schultz, Jr., secretary-treasurer.

Arkansas Veterinary Medical Association. Annual meeting. Hotel Marion, Little Rock, Feb. 1-2, 1959. H. M. Goins, Box 152, Berryville, Ark., secretary-treasurer.

California Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Feb. 2-4, 1959. John W. Kendrick, conference chairman.

Ohio State Veterinary Medical Association. Annual convention. Neil House Hotel, Columbus, Feb. 4-6, 1959. Ohio V.M.A. Offices, 1411 W. Third Ave., Columbus, Ohio.

Oregon Veterinary Medical Association. Winter meeting. Multnomah Hotel, Portland, Feb. 6-7, 1959. O. H. Muth, secretary-treasurer.

West Virginia Veterinary Medical Association. Winter meeting. Greenbrier Hotel, White Sulphur Springs, Feb. 8-9, 1959. Harry J. Fallon, 200 Fifth St., West Huntington, W. Va., secretary-treasurer.

Colorado State University. Twentieth annual conference for veterinarians. Glover Veterinary Hospital, College of Veterinary Medicine, Fort Collins, Feb. 16-18, 1959. A short course on bull evaluation will be held, February 14-15. O.R. Adams, program chairman.

Illinois State Veterinary Medical Association. Annual meeting. LaSalle Hotel, Chicago, Feb. 16-18, 1959. C. B. Hostetter, 1385 Whitcomb Ave., Des Plaines, executive secretary.

Indiana Veterinary Medical Association and Vita Vet Laboratories. Annual nutrition conference for veterinarians. Public Health Building, Indianapolis, Ind., Feb. 25, 1959. J. M. Carter, chairman.

Third Pan American Congress of Veterinary Medicine and Ninety-Sixth Annual Meeting, American Veterinary Medical Association. Joint meeting. Kansas City, Mo., Aug. 23-27, 1959. H. E. Kingman, Jr., executive-secretary, AVMA, 600 S. Michigan Ave., Chicago 5, Ill. B. D.

Blood, secretary-general, Directing Council, Pan American Congress of Veterinary Medicine, P.O. Box 99, Anal, F.C.N.G.R., Argentina, S.A.

Missouri Veterinary Medical Association. Winter meeting. Hotel Statler, St. Louis, Feb. 26-28, 1959. Paul L. Spencer, P.O. Box 283, Jefferson City, Mo., secretary.

### Foreign Meetings

International Veterinary Congress. Sixteenth session. Madrid, Spain, May 21-27, 1959. Prof. Pedro Carda A., general secretary, Calle Villanueva 11, Madrid.

U.S. COMMITTEE: Dr. W. A. Hagan, chairman, New York State Veterinary College, Ithaca, N. Y.; Dr. J. G. Hardenbergh, secretary, 600 S. Michigan Ave., Chicago 5, Ill.

Third World Congress on Fertility and Sterility Amsterdam, Holland, June 7-13, 1959. Dr. L. I. Swaab, Sing Agnietenstraat 4, Amsterdam, Holland, honorary secretary.

### Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Medical Association, the first Thursday of each month. Capt. Joe T. Williams, Qtrs. 931-C, Maxwell A.F.B., Ala., secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. Dan P. Griswold, Jr., 714 S. 39th St., Birmingham, secretary.

Mobile-Baldwin Counties Veterinary Medical Association, the third Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, P.O. Box 1767, Decatur, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. J. W. Langley, Jr., P.O. Box 5013, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. Gwyn Chapin, 2215 E. Calle Vista, Tucson, Ariz., secretary.

ARKANSAS—Pulaski County Veterinary Medical Society, the second Tuesday of each month. Harvie R. Ellis, 54 Belmont Drive, Little Rock, Ark., secretary-treasurer.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. John S. Blackard, 420 Appian Way, Richmond, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16 St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Paul S. Chaffee, 2333 McKinley Ave., Fresno, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. Norman E. Cunningham, 2703 "M" St., Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. V. Todorovic, 47 Mann Ave., Watsonville, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. T. J. Carleton, 325 W. Lockeford St., Lodi, Calif., secretary-treasurer.

Orange Belt Veterinary Medical Association, the second Monday of each month. Robert Lapham, 1194 W. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. H. M. Stanton, 1122 S.E. U.S. Highway 101, Tustin, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. Robert Lawson, Los Altos, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, 2075 Silverado Trail, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. R. A. Mueller, 6420 Freepoint Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. E. P. Bogart, P.O. Box 758, Vista, Calif., secretary.

San Fernando Valley Chapter SCVMA, the second Tuesday of each month at 7:30 p.m., Hody's Restaurant, North Hollywood, Calif. Dr. V. H. Austin, 14931 Oxnard St., Van Nuys, secretary-treasurer.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, Calif., secretary.

Santa Clara Valley Veterinary Medical Association, the fourth Tuesday of each month. Kay Bewley, 1410 N. 4th St., San Jose, Calif., secretary.

## Jensen-Salsbery Introduces New Trade Journal

The publishers of the *Jen-Sal Journal* have introduced a new publication to the veterinary literature. *Jen-Sal Small Animal Topics* begins its life as a handy pocket-sized quarterly and will be sent only to members of the profession.

The first issue contains an original article on digitalis therapy in the dog, a section on clinical tips, some abstracts from current literature, an interesting case report, and several articles on the use of Jen-Sal products.

The AVMA congratulates the publishers of this attractive new trade journal and wishes for it a degree of success commensurate with that of its companion journal.

Southern California Veterinary Medical Association, the last Wednesday of each month. Robert Schroeder, 9738 Tecum Rd., Downey, Calif., secretary.

Tulare County Veterinary Medical Association, the second Thursday of each month. Lionel H. Brazil, Route 4, Box 53, Tulare, Calif., secretary.

COLORADO—Denver Area Veterinary Medical Society, the fourth Tuesday of every month. Gene M. Bierhaus, 2896 S. Federal Blvd., Englewood, Colo., secretary-treasurer.

Northern Colorado Veterinary Medical Society, the first Wednesday of each month, in Fort Collins. Dr. James Voss, Veterinary Hospital, Colorado State University, Fort Collins, Colo., secretary.

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**DELAWARE**—New Castle County Veterinary Medical Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. A. P. Mayer, Jr., R.F.D. 2, Newark, Del., secretary-treasurer.

**DISTRICT OF COLUMBIA**—District of Columbia Veterinary Medical Association, the second Tuesday evenings of January, March, May, and October. William I. Gay, 5200 Chandler St., Bethesda, Md., secretary-treasurer.

**FLORIDA**—Central Florida Veterinary Medical Association, the first Friday of each month at 8:00 p.m., place specified monthly. L. R. Poe, 753 W. Fairbanks Ave., Winter Park, Fla., secretary-treasurer.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse

Inn, St. Petersburg. Fred Jones, 3606 S. Dale Mabry, Tampa, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodson's Restaurant, Stephen C. Hite, 3051 Beldin, Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. John Webb, P.O. Box 183, Cantonment, Fla., secretary-treasurer.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. B. W. Bigger, 2833 S. 4th St., Fort Pierce, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. John S. Haromy, Route #1, Box 107-A, Lake Wales, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Joe B. O'Quinn, 1690 E. 4th, Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville, G. L. Burch, P.O. Box 405, Ocala, Fla., secretary-treasurer.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. Robert E. Cope, 127 E. Mason, Daytona Beach, Fla., secretary.

**GEORGIA**—Atlanta Veterinary Medical Society, the third Thursday of each month at the Elk's Home, 726 Peachtree St., Atlanta. W. V. Smith, 1039 Marietta St., N.W., Atlanta, Ga., secretary.

Georgia-Carolina Veterinary Medical Association, the second Monday of each month at 8:00 p.m., at the Town Tavern, Augusta, Ga. H. G. Blalock, Jr., 2190 Highland Ave., Augusta, secretary.



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DESIGNED FOR

the veterinarian

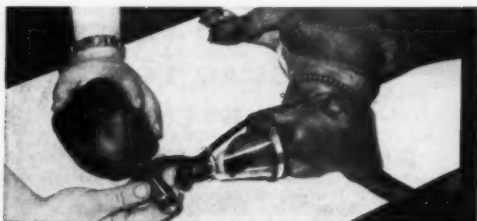


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This unit can be used efficiently for straight flow oxygen therapy or for resuscitation. Routine intubation and "oxygen cage" techniques are no longer needed.

The inhaler assembly can be attached to a large or small oxygen cylinder equipped with means to govern flow rate. Assembly has a pressure limiting valve, plus a non-rebreathing valve to assure pure oxygen supply.

Oxygen and anesthetic gases available nationwide from Ohio branches and dealers.



Positive pressure resuscitation is accomplished by squeezing non-rebreathing bag with thumb over exhalation port.

Transparent face masks are provided in large and small sizes. Unit is complete with tubing and mask retainer straps.

The dependability of Ohio Chemical equipment is backed by 45 years of service to hospitals. For added information on this unit, please request bulletin 4658.



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Model 901 Basic Unit .....\$40.00\*  
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(Deluxe unit has sturdy carrying case, and is equipped with yoke and needle assembly)  
\*FOB Madison, Wis. (Prices slightly higher in Canada)

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(A Division of Air Reduction Company, Inc.)

# NEW GAINES: first meal that mixes better than expensive kibble!

DEVELOPED IN THE  
GAINES RESEARCH KENNELS  
•  
TESTED IN 14  
INDEPENDENT KENNELS



New crunchy nuggets keep their shape for hours  
... won't mush or cake, even in boiling water!

Yes, new "controlled" texture means easier mixing . . . easier eating. Gaines gives your dogs a new taste, too: the flavor of real beef!

New Gaines is highly digestible. Specially processed to prevent stool problems. Better-than-ever in body, to keep your dogs at their winning best. And each nugget contains the same homogenized balance of essential nutrients that has helped generations of champions to a longer prime of life.

All these advantages—in the first meal that mixes even better than kibble! Discover New Gaines for yourself—soon!

**GAINES MEAL:** *The "Longer Prime of Life" Dog Food*



New Gaines Meal has a bright new bag: 25- and 50-lb. sizes



## Castle's 777 SpeedClave...

**reaches spore-killing  
temperatures in 4-8 minutes!**

Here you have the simplest and quickest way to sterilize—with Castle's 777.

The 777 SpeedClave gives you added protection from Canine Infectious Hepatitis and other communicable small animal diseases. Completely automatic. You just load it... "set it and forget it." It reaches spore-killing temperatures fast. Sterilizes in minutes, then shuts itself off automatically.

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Name.....

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**ILLINOIS**—Chicago Veterinary Medical Association, the second Tuesday of each month. Charles H. Armstrong, 1021 Davis St., Evanston, secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. E. I. Pilchard, Champaign, Ill., secretary-treasurer.

**INDIANA**—Central Indiana Veterinary Medical Association, the second Wednesday of each month. P. T. Parker, 224 N. Mill St., secretary-treasurer.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. Stanton Williamson, 217 W. Chippewa St., South Bend, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P.O. Box 52, Pendleton, Ind., secretary.

**IOWA**—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo, Iowa. A. J. Cotten, P.O. Box 183, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, 202 S. Hazel Ave., Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Veterinary Medical Society, the Second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. T. F. Bartley, P.O. Box 454, Cedar Rapids, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardison Hotel, Estherville, Iowa. Barry Barnes, P.O. Box 162, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer, Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, 202 S. Stone St., Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. W. A. Danker, Dows, Iowa, secretary.

**KENTUCKY**—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. R. H. Folsom, P.O. Box 323, Danville, Ky., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday of each month in Louisville or within a radius of 50 miles, except January, May, and July. G. R. Comfort, 2102 Reynolds Lane, Louisville, Ky., secretary-treasurer.

**MARYLAND**—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore,

Md. Leonard D. Krinsky, 6111 Harford Rd., Baltimore, Md., secretary.

**MICHIGAN**—Central Michigan Veterinary Medical Association, the first Wednesday of every month at 7 p.m. Jerry Fries, 2070 E. Main St., Owosso, Mich., secretary.

Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert W. Acton, 4110 Spring Rd., Jackson, Mich.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. Alvin R. Conquest, P.O. Box 514, Grand Blanc, Mich., secretary.

Southeastern Michigan Veterinary Medical Association, the fourth Wednesday of every month, September through May. Louis J. Rossoni, 24531 Princeton Ave., Dearborn 8, Mich., secretary.

**MISSOURI**—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Edwin E. Epstein, 4877 Natural Bridge Ave., St. Louis 15, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Thursday of each month at the Hotel President, Kansas City, Mo. Robert E. Guilfoil, 18 N. 2nd St., Kansas City, 18, Kan., secretary.

**NEVADA**—Western Nevada Veterinary Society, the first Tuesday of each month. Paul S. Silva, 1170 Airport Road, Reno, Nev., secretary.

**NEW JERSEY**—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, R.D. 1, Box 284A, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April, except December, at the Irvington House, 925 Springfield Ave., Irvington, N.J. Bernard M. Weiner, 787 Clinton Ave., Newark, N.J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Elks Club, Hackensack. James R. Tanzola, Upper Saddle River, N.J., secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. L. Smith, P.O. Box 938, Trenton, N.J., secretary.

South New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. R. M. Sauer, Fittipaldi Animal Hospital, Collingswood, N.J., secretary.

**NEW MEXICO**—Bernalillo County Veterinary Practitioners Association, third Wednesday of each month, Fex Club, Albuquerque, N.M. Jack Ambrose, 3018 N. Rio Grande Blvd., Albuquerque, secretary-treasurer.

**NEW YORK**—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

**NORTH CAROLINA**—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. C. G. Sims, 2450 Battleground Ave., Greensboro, N. Car., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. J. G. Martin, Boone, N. Car., secretary.

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# In cattle shipment cut weight losses by over 50%

## Injection SPARINE makes money for you.

Even after an 18-hour trip, SPARINE, given intramuscularly to cattle, reduced shrinkage in most cases over 50%.

Group*	No. of Animals	Weight prior to shipping		Weight at Feed lot		Loss in pounds		% of shrink
		Total	Average	Total	Average	Group	Average	
1—SPARINE, 0.5 mg./lb.	73	25,525	349.6	24,840	340.25	685	9.25	2.6
2—Untreated	30	10,365	345.5	9,775	325.89	590	19.8	5.6
3—SPARINE, 0.5 mg./lb.	59	26,365	446.65	25,562	433.3	803	13.3	3.04
4—Untreated	26	11,300	434.7	10,530	405	770	29.6	6.89
5—SPARINE, 0.4 mg./lb.	50	30,010	600.2	27,030	540.6	2,980	59.6	9.93
6—Untreated	50	31,160	623.2	27,070	541.4	4,090	81.8	13.12

\*Groups 1 to 4 travelled 18 hours by truck. Groups 5 and 6 travelled 17 hours by truck.





## MEMO

To: John Doe, D.V.M.

Subject: New indication for SPARINE, I.M.

Cattlemen will be reading this advertisement. We are telling them about Injection SPARINE and the savings that it will effect. They will call on you for advice on the use of SPARINE to reduce weight losses due to the rigors of shipping.

SPARINE has been the first choice of the D.V.M. in many applications in small animal practice and in preparation of large and small animals for surgical procedures. Now it stands as the best drug available for stopping the cattle shipper's monetary loss due to shrinkage in transit.

### AVAILABLE:

Injection: 50 mg. per cc., vials of 10, 30 cc.,  
and now in a new size package—100 cc.

Tablets: 25, 50 and 100 mg., vials of 50.

Cattle lose weight  
But if Injection  
weight losses

SPARINE reduces  
unruliness of  
SPARINE and  
grogginess.

SPARINE in cattle helps  
fence walking, and bawling. The result is  
interruptions.

REMEMBER, before shipping, talk to your veterinarian about SPARINE.

# Injection Sparine<sup>®</sup>

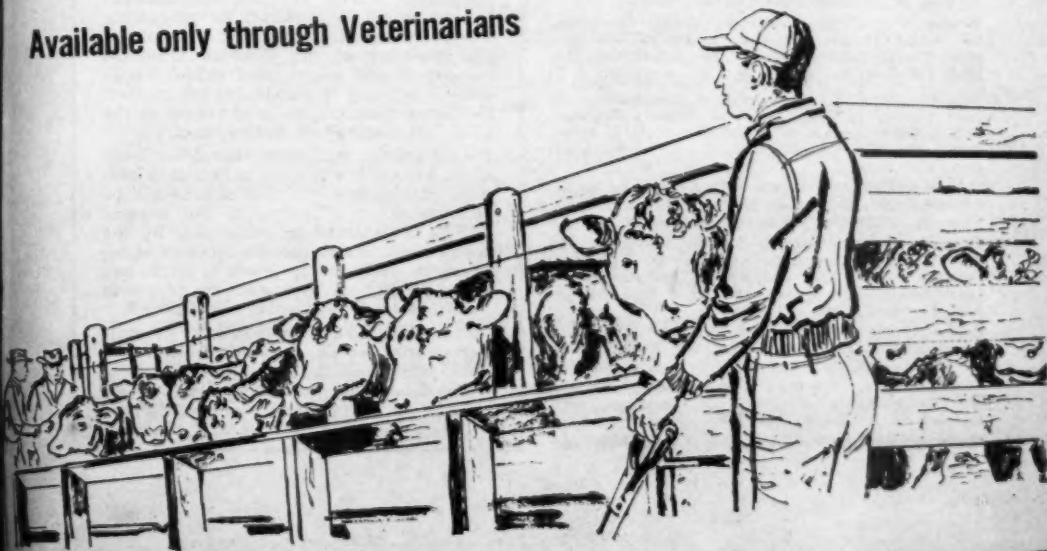
HYDROCHLORIDE

Promazine Hydrochloride, Wyeth



Philadelphia 1, Pa.

Available only through Veterinarians



## J. E. Sullivan Named Southern Veterinary Sales Manager of Schering

James E. Sullivan, Jr., has been appointed Southern division manager of veterinary sales for Schering Corporation, it was announced Nov. 11, 1958, by Charles W. Rahner, Jr., veterinary sales manager.



James E. Sullivan, Jr.

Mr. Sullivan will be responsible for the employment, supervision, and training of the company's sales representatives in the Southern states.

Joining the veterinary sales force at Schering in May, 1956, Mr. Sullivan had represented the company in the New England area prior to his current assignment. He had formerly been a sales representative for the Pitman-Moore Company. Mr. Sullivan holds a degree in biology which he received from Middlebury College, Vt., in 1949.

Twin Carolinas Veterinary Medical Association, the third Friday of each month at Orange Bowl Restaurant, Rockingham, N. Car., at 7:30 p.m. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every month at 7:00 p.m. in the George Vanderbilt Hotel, Asheville, N. Car. Viui Lind, 346 State St., Marion, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road, G. C. Lewis, 451 E. Galbraith Rd., Cincinnati, Ohio, secretary-treasurer.

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, 3120 Valley View Dr., Columbus, Ohio, secretary-treasurer.

Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, 8208 Carnegie Ave., Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, 6941 Far Hills Ave., Dayton, secretary.

Killbuck Valley Veterinary Medical Association, the first Wednesday of alternate months beginning with February. D. J. Kern, Killbuck, Ohio, secretary-treasurer.

Mahoning County Veterinary Medical Association, the

fourth Tuesday of each month, at 9:00 p.m., Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

Northwestern Ohio Veterinary Medical Association, the last Wednesday of March and July. C. S. Alvanos, 1683 W. Bancroft St., Toledo, Ohio, secretary-treasurer.

Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge, Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, 42 W. Market St., Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Forest H. Stockton, 2716 S.W. 29th St. Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thurs-

## AVMA Research Fellowships Available

The Council on Research of the AVMA announces the availability of a number of fellowships for postgraduate training for the academic year, 1959-1960.

The recipient of a fellowship must be a veterinarian and a citizen of the United States or Canada. Veterinary students who expect to graduate at the end of the current school year and who wish to follow a career in research may apply for a fellowship.

The latest date for filing the completed application is Feb. 15, 1959. Approximately one month is required for processing completed applications after receipt by the secretary of the Council. Qualified persons should secure and submit applications as early as possible to insure their file being complete for presentation to the Committee on Fellowships.

The Committee on Fellowships of the Council on Research will meet in March to consider applications, and the awards will be announced soon afterward. The stipend will be determined in each case by the needs of the individual, the location of the school in which he proposes to work, and other factors. In general, the stipends range from \$100 monthly and upward.

Any qualified person interested in graduate training may obtain application blanks and other information by writing to Secretary, AVMA Council on Research, C. H. Cunningham, College of Veterinary Medicine, Michigan State University, East Lansing, Mich.



*in chronic respiratory disease of poultry*

## **FUROXONE® AERODUST**

BRAND OF FURAZOLIDONE

VETERINARY

provides bactericidal action at the site of infection

A new dosage form for inhalation, FUROXONE AERODUST VETERINARY is a fine, light, yellow powder that contains Furoxone 25%, and remains suspended in the air for 30 minutes or longer. It is indicated for the treatment of chronic respiratory disease (C.R.D. or air sac infection) in poultry flocks.

Administration: For each 1,000 chickens, empty the contents of one 100 gram carton into a dust applicator such as a Hudson Admiral Duster No. 766. In dim light or darkness, direct dust cloud about 2 feet over birds from a distance of 5 to 6 feet from nearest bird.

Supplied: Carton of 100 Gm.

*Other Eaton veterinary preparations for poultry:*

**FUROXONE CONCENTRATE VETERINARY**—Feed additive for salmonellosis, histomoniasis, hexamitiasis, synovitis and control of secondary invaders associated with chronic respiratory disease and non-specific enteritis.

**FURACIN® WATER MIX VETERINARY**—Drinking water additive for the brand of nitrofurans control of outbreaks of cecal and intestinal coccidiosis due to *Eimeria tenella* and *E. necatrix* in chickens.

Available through your professional veterinary distributor



**NITROFURANS**—a new class of antimicrobials . . .  
neither antibiotics nor sulfonamides  
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day of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Arlen D. Hill, 5302 E. 11th St., Tulsa, Okla., secretary.

Tulsa Association of Small Animal Veterinarians, first and third Mondays, City-County Health Dept. T. E. Messler, 3104 E. 51st St., Tulsa, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m. Ireland's Restaurant, Lloyds', 718 N.E. 12th Ave. Portland. Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinary Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Robert J. Mallorie, P.O. Box 155, Silverton, Ore., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine. Raymond C. Snyder, N.E. Corner 47th St. and Hazel Ave., Philadelphia 43, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Thursday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Pennsylvania Northern Tier Veterinary Medical Association, the third Wednesday of each odd numbered month. R. L. Michel, Troy, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

Georgia-Carolina Veterinary Medical Association—see GEORGIA.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. Jack E. Habluetzel, Route 1, Box 65-N, Ingleside, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary Ct., Richmond 20, Va., secretary.

Northern Virginia Veterinary Conference Association, the second Tuesday of each month. T. P. Koudelka, P.O. Box 694, Harrisonburg, Va., secretary.



Big Red likes to keep up with the times. But he doesn't change for changes' sake. Like a Brooks suit or a Rolls Royce, the built-in quality of Big Red Dog Foods is essentially stable — it stays at the same high level!

Changes in Big Red are of two kinds: Improvement in nutritional value. And improvement in something other than nutritional value. The recent change in the meal was of the second kind.

Here is what it means to you:

1. Palatability is improved
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3. Texture is coarser

These changes are made by adding pure animal fat at the time of blending. And the fat is protected from rancidity by a special treatment.

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Cans: Big Red Beef, Horsemeat, Chicken, Ration

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**STRIKES**

**INTESTINAL INFECTION**

**BIOSOL LIQUID**, an exceptionally potent anti-diarrheal agent in crystal-clear aqueous solution form, contains the broad-spectrum antibiotic neomycin. Versatility permits easy treatment of herd, flock, kennel or individual. Biosol, added to the drinking water, milk or feed, or administered as a drench, is absorbed only sparingly... assures prompt, positive antidiarrheal action because it remains where it is needed most: at the infection site... the gut. Its nontoxic and demulcent properties make Biosol particularly effective in treating stubborn bacterial diarrheas in very young or sick animals, as well as in more easily managed cases. Available in economical 4 oz. and pint bottles. Each ounce contains 6 Gm. of neomycin activity (present as neomycin sulfate commercial grade).

\*TRADEMARK, REG. U. S. PAT. OFF.

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**BIOSOL  
LIQUID**





### Veterinary Wholesalers Form New Association

Mr. C. Guy Stephenson, president of Goshen Laboratories, is the first president of a new group known as the National Veterinary Wholesalers Association. Membership will be open to all independently owned firms which sell only to veterinarians. Any firm selling in the veterinary field may obtain an associate membership. Corresponding memberships can be granted to firms which operate outside the territorial limits of the United States and its possessions. An honorary or complimentary membership can be granted to members of college faculties, regional veterinary associations, and governmental agencies.

The association was formed after a series of meetings between representatives of regional groups had disclosed concern among all of them with current discounting, credit, and rebate practices.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwestern Virginia Veterinary Medical Association, the first Thursday of each month. D. F. Watson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle. Roy C. Toole, 10415 Main St., Bellevue, secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. B. D. Benedictson, 3712 Plummer St., Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the third Thursday of each month in the Hotel Pritchard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.) W. E. Gladitsch, 914 Riggs St., Bloomer, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. R. H. Steinkraus, 7701 N. 59th St., Milwaukee, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

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### ARNOLD CALF SCOUR COMPOUND ARNOLD CALF SCOUR VITAFORM

Calf Scour Compound, dependable and proven effective in the field, is a three-way antidiarrheal used successfully in scours where vitamin deficiencies are not a problem.

It exerts penetrating antibacterial action • Neutralizes gastrointestinal toxicity • Favors healing and protects mucosal surfaces. Calf Scour Vitaform, preferred

by many because it contains added vitamins to correct vitamin deficiencies frequently preceding or accompanying diarrhea. A four-way antidiarrheal, it combines . . . Multiple sulfonamide therapy • Gastrointestinal detoxification • Soothing, demulcent action • Helps replace depleted stores of 8 important vitamins.

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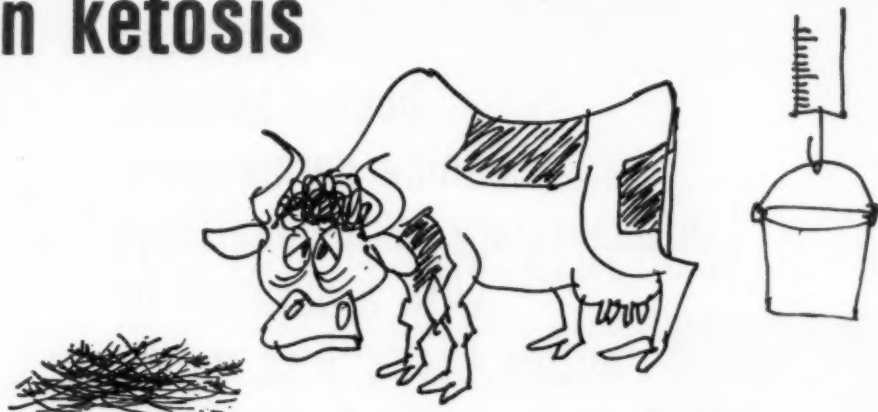
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NEW CASTLE, INDIANA, U. S. A.



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When appetite fades and milk production falls . . . use

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BRAND OF PREDNISOLONE



to put her back on feed and restore milk volume faster

**STERANE**— for an early return to milk production.

**STERANE**, three to five times more potent than hydrocortisone and cortisone, stimulates glucose formation and helps re-establish physiological equilibrium. In clinical studies a single intramuscular injection of 50 to 100 mg. of Sterane promptly restored energy metabolism, with rapid reversal of ketotic symptoms in over 83 per cent of 299 cases treated.

**STERANE INTRAMUSCULAR-VETERINARY**

*Sold to veterinarians only*

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Department of Veterinary Medicine, PFIZER LABORATORIES, Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.

to treat  
bovine ketosis,  
canine dermatoses,  
inflammatory joint conditions  
with a duration of  
action that's "just right"

# Ultracortenol<sup>®</sup>

(prednisolone trimethylacetate CIBA)

**ULTRACORTENOL** is a new and improved glucocorticoid with distinct advantages over prednisone and prednisolone: the duration of therapeutic action is "just right" and therefore optimally effective. Hence, a single intramuscular injection generally achieves the desired effects, and daily injections or supportive oral therapy are not needed to maintain effective corticoid levels.

**ULTRACORTENOL** has been extensively tested and enthusiastically accepted by a number of small- and large-animal practitioners<sup>1-10</sup> who found these regimens to be highly effective:

Dairy Cow	Ketosis (acetonemia)	Single 100- to 200-mg. injection*
	Shock ("downer" cow) syndrome	Single 200-mg. injection as supportive therapy.
Dog	Dermatoses	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. For sustained therapy, repeat once or twice a week as indicated.
	Inflammatory joint conditions	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. Supportive oral therapy not necessary.

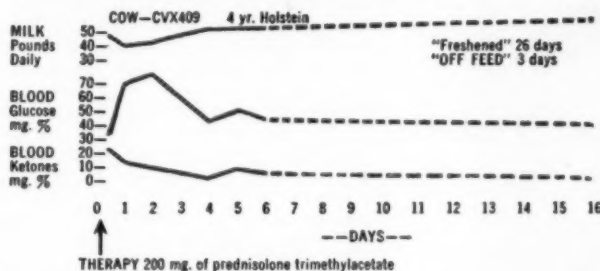
\*This initial injection may be reduced to 50 to 100 mg. intramuscularly if simultaneous administration of intravenous glucose is given, thus permitting more economical glucocorticoid therapy. If necessary, either regimen may be augmented by an additional injection of 50 to 100 mg. Ultracortenol after 24 to 48 hours.

**C I B A Effective Veterinary Drugs, Products of Exacting Research**

# New injectable glucocorticoid

**BOVINE KETOSIS** Following a single intramuscular injection of Ultracortenol, investigators observe that:

- appetite is restored, depression is dispelled within 12 to 24 hours<sup>1</sup>
- blood glucose levels are raised within 12 hours<sup>1</sup>
- blood ketone levels return to normal within 24 to 96 hours<sup>1</sup>
- a steady increase in milk production begins after 48 hours.<sup>2</sup>



This chart shows the good response in ketotic cow following intramuscular injection of 200 mg. of Ultracortenol.

(Adapted from Vigue<sup>1</sup>)

**CANINE DERMATOSES** Reporting on 9 animals (of whom 6 received 15 or 20 mg. Ultracortenol in a single intramuscular dose), Pollock<sup>3</sup> says, "... Ultracorten Trimethylacetate [Ultracortenol] proved effective not only against the seemingly innocuous lesions, but also against the hemorrhagic dermatitis associated with exquisite pain." And, "The duration of the anti-inflammatory phase varies from seven to ten days depending upon the dosage. ..."<sup>3</sup>

**References:** 1. Vigue, R. F.: J.A.V.M.A. 133:326 (Sept. 15) 1958. 2. Shaw, J. C.: Personal communication. 3. Pollock, S.: To be published. 4. Rabin, P. H.: Personal communication. 5. Hoffer, S. H.: Personal communication. 6. Weir, H. T., and Hazelrig, J. W.: Personal communication. 7. Beck, J. W.: Personal communication. 8. Bull, W. S.: Personal communication. 9. Fessenden, P. E.: Personal communication. 10. Lohmeyer, C.: Personal communication.

**SUPPLIED:** Multiple-dose Vials, 10 ml., each ml. containing 10 mg. or 25 mg. of prednisolone trimethylacetate in suspension for injection.

**ULTRACORTENOL** is available from ethical veterinary distributors throughout the United States.

2/2002 VK

C I B A SUMMIT, NEW JERSEY



Rock Valley Veterinary Medical Association, the first Wednesday of each month. L. C. Allenstein, 209 S. Taft St., Whitewater, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. John B. Fleming, 209 E. 4th St., Marshfield, Wis., secretary.

### Dr. Alan R. Wagner Joins Staff at Warren-Teed

Dr. Alan R. Wagner (OSU '46) has joined the staff of the newly formed pathology department, veterinary division, of the Warren-Teed Products Co., Columbus, Ohio.



Dr. Alan R. Wagner

Dr. Wagner specialized in pathology and research at Ohio Diagnostic Laboratories at Reynoldsburg and, more recently, with the American Cyanamid Co., in Pearl River, N.Y. He is a member of the Animal Care Panel of New York University, Bellevue Medical Center, the New York Academy of Sciences, Phi Zeta, and Alpha Psi.

### Free Check Analysis Service for Veterinarians

Availability of a free check analysis service for veterinarians primarily to help them redesign their checks for electronic bank bookkeeping has been announced by the Todd Co. Division, Burroughs Corp., Rochester, N.Y.

To take advantage of the service, companies should send a sample of the check or checks they use to the attention of the Check Analysis and Design Dept., Todd Company Division, Burroughs Corp., P.O. Box 910, Rochester 3, N.Y. Check samples should be canceled by an all-zero check-writer impression on the amount line.

## Instructions to Authors

### JOURNAL of the AVMA

**Exclusive Publication.**—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals, which is ethical publication procedure.

**Manuscripts.**—Manuscripts, including footnotes, references, and tables, must be typewritten, double-spaced, on 8½- by 11-in. bond paper, and the original and one carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise. Short, simple sentences are clearer and more forceful than long, complex ones.

**Illustrations.**—Photographs should be furnished in glossy prints, and of a size that will fit into the JOURNAL of the American Veterinary Medical Association with a minimum of reduction. Photomicrographs which can not be reduced should be marked for cropping to 1-column or 2-column width. Identifying marks within the photomicrographs, such as arrows, letters, or numbers, should be clearly marked with black India ink or white opaque ink to insure good contrast for reproduction and must be large enough to stand reduction, if necessary.

Drawings, graphs, and charts should be made clearly and accurately in India ink on white paper and a glossy print of them submitted when possible. Numbers or letters appearing on graphs or charts should be large enough to allow for any reduction necessary for the chart or graph to fit JOURNAL pages. Blue lines in graph paper drop out in reproduction; therefore, if lines are required they must be drawn in black ink. All illustrations should bear the name of the author and the illustration number on the back.

**Tables.**—Tables should be simple and typed double space. Complex tables are not conducive to perusal. It is wiser to summarize complex material than to tabulate it.

**References.**—References should be typed double space, in alphabetical order, and should be prepared in the following style: name of author, title of article, name of periodical with volume, year, and page numbers. References to journals not commonly known should give the complete name of the periodical, and where published so that they may be added to our reference files. When books are cited, the name of publisher, location, edition, and year should be given.

American Veterinary Medical Association  
600 S. Michigan Avenue  
Chicago 5, Illinois



## National Livestock Loss Prevention Year

Plans to make 1959 "National Livestock Loss Prevention Year," with the practicing veterinarian featured in the forefront of the project, have been announced.

The 12-month nation-wide effort to reduce today's huge livestock losses from diseases and parasites will be conducted with the cooperation of farm magazines, radio and television farm editors, newspapers, leading livestock associations, and veterinary groups. It will be sponsored by member companies of Associated Veterinary Laboratories through their educational bureau, the American Foundation for Animal Health.

The coast-to-coast campaign will have two major objectives: (1) to focus the farmer's attention on the really major causes of livestock losses, and (2) to emphasize the role of the veterinarian as best qualified to help prevent losses.

The basic plan of action involves selecting one or more major disease, parasitic, or nutritional problems for special emphasis each month.

The nation's farmers and ranchers are losing more than \$2 billion a year because of preventable diseases. This represents an average of more than \$11 for every man, woman, and child in this country. The difference which loss-reductions of even one third or one fourth could make to the nation's livestock owners is enormous.

To enlist cooperation in the 1959 effort, the American Foundation for Animal Health has had members of its central office staff confer with the editorial staffs of major farm magazines, news bureaus, and radio and television networks, and has received almost universal offers of cooperation.

Starting January 1, a continuous flow of educational material is being issued, including articles for farm magazines, articles for the national news bureaus and the farm editors of all leading newspapers, illustrated scripts for television stations, broadcast material for radio farm editors, and special copy for the livestock press. This material stresses one major disease problem at a time, bringing out the value of veterinary service in dealing with each problem.

In addition, Associated Veterinary Laboratories is tying in their farm magazine advertising campaign on "Call Your Veterinarian First" with the National Livestock Loss Prevention Year theme. This campaign will have upward of 17 million readers in 1959.

Names of companies underwriting National Livestock Loss Prevention Year are: Allied Laboratories, Inc.; Blue Cross Serum Co.; Corn Belt Laboratories, Inc.; Corn States Laboratories, Inc.; Fort Dodge Laboratories, Inc.; Grain Belt Supply Co.; Jensen-Salsbery Laboratories, Inc.; Liberty Laboratories; Norden Laboratories; Pitman-Moore Co.; Sioux Falls Laboratories, Inc.; Gregory Laboratory, Inc.; National Laboratories Corp.; and Southwestern Serum Co.

## CLASSIFIED ADVERTISEMENTS

**PERSONAL WANT ADS**—\$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

**TOTAL WORD COUNT** must include complete box number address (8 words) or personal address line.

**COMMERCIAL WANT ADS**—\$5.00 for the first 25 words, 25 cents for each additional word; \$1.00 for use of box number. (See paragraph above for total word count.)

**Remittance must accompany ad.**

### DEADLINES

**1st of month issue** — 8th of month preceding date of issue.

**15th of month issue** — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

### Wanted—Veterinarians

Chief, Division of Food and Sanitation in health department of progressive midwest city of 60,000. Responsible for slaughterhouse regulations, meat and milk inspections, and environmental sanitation. D.V.M. degree, and public health experience desirable. Salary range \$6,828-\$8,028. Retirement plan and Social Security; and liberal hospitalization, sick leave, and vacation benefits. Write Director of Personnel, City Hall, Kenosha, Wisconsin.

Veterinarian at once to assist in mixed practice. Modern small animal hospital, sale barn, and large animal work. Auto required. Contact Dr. Elmer F. Goetz, 709 South 18th, Mattoon, Ill.

Veterinarian wanted—practice 85 per cent large animal; large and small animal hospital. Could lead to partnership. Write F. D. Custer, Oakland, Md.

Pathologist—presently have opening for M.D. or D.V.M. pathologist position as chief of pathology section of research laboratories. Experience in toxicology desired; salary open. Forward resumes of training, experience, salary required, to Personnel Director, Eaton Laboratories Division, The Norwich Pharmacal Company, Norwich, N.Y.

Wanted—assistant veterinarian for small animal hospital in Chicago, preferably by February 1. Excellent experience. Address "Box A 15," c/o JOURNAL of the AVMA.

Assistant wanted for small animal practice in Long Island, N.Y. Please state age, experience, college and year graduated, salary desired, marital status, three references. Address "Box A 19," c/o JOURNAL of the AVMA.

Veterinarian wanted—to assist in small animal practice in Texas. New graduates and semi-retired men considered. Address "Box A 23," c/o JOURNAL of the AVMA.

To insure prompt delivery  
replies should be carefully addressed.

### Wanted—Positions

Relief veterinarian available, New York and New Jersey licenses, small animals only. Address D.V.M., 1007 80th St., North Bergen, N.J.

Senior student (Oklahoma State University), graduating May, 1959, desires mutually beneficial alliance with above average mixed practice in Midwest. Interview requested. Address "Box A 16," c/o JOURNAL of the AVMA.

Graduate (1955), completes military in February, desires small animal practice position. Licensed in Pennsylvania and Maryland. Address "Box A 18," c/o JOURNAL of the AVMA.

Graduate (COR '55), desires position in small animal practice in suburbs of New York City. Experienced; available February, 1959. Address "Box A 21," c/o JOURNAL of the AVMA.

### Wanted—Practices

Wanted to purchase—established, lucrative, one- or two-man small animal practice. Desire information on practice in your original letter, gross, price. Address "Box T 5," c/o JOURNAL of the AVMA.

Desire to purchase or lease—mixed or small animal practice; prefer Midwest. Please supply full information. Address "Box A 17," c/o JOURNAL of the AVMA.

Experienced, reliable small animal practitioner desires to lease preferably with options, small animal hospital in Los Angeles or near vicinity. Address "Box A 20," c/o JOURNAL of the AVMA.

Small animal hospital to lease or buy, New York State or Southwest; preferably a two-man practice. Address "Box A 22," c/o JOURNAL of the AVMA.

Seek suburban small animal hospital New York, Maryland, New Jersey, Connecticut, Virginia. Give sale details first letter. Address "Box A 24," c/o JOURNAL of the AVMA.

Desire to purchase established general or small animal practice in central or western New York. Licensed, experienced. Would also consider associating with older practitioner. Address "Box A 25," c/o JOURNAL of the AVMA.

Wanted to purchase or lease at premium—one- or two-man small animal hospital in Midwest. Please give details of practice in first letter. Address "Box A 27," c/o JOURNAL of the AVMA.

Wanted to purchase—small animal hospital or mixed practice in Virginia by experienced and financially responsible veterinarian. Address "Box A 28," c/o JOURNAL of the AVMA.

### For Sale or Lease—Practices

Virginia—established mixed practice in prosperous community. Reasonable price includes fully-equipped ranch styled small animal hospital and apartment, air-conditioning, two-way radios, etc. Address "Box T 16," c/o JOURNAL of the AVMA.

Fully-equipped hospital and apartment in heavily populated section of Chicago. \$25,000; \$5,000 down. Will consider lease; \$350 including apartment. Give personal and credit references in first letter. Address "Box T 38," c/o JOURNAL of the AVMA.

For sale—general practice in northeastern Michigan. Excellent dairy with significant small animal practice. Near popular resort area; good house, hospital, three acres, all drugs and equipment—\$22,000. Address "Box A 26," c/o JOURNAL of the AVMA.

### Miscellaneous

Your prescriptions and private formulas compounded to your specifications. Bulk or packaged. Labels—tubes—dispensing items. Consultations invited. Ambur Laboratories, 724 East Verdugo, Burbank, Calif.

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for  
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action in



canine diarrheas

and  
calf scours



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Now available in  
3 convenient forms\*

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*Carob Powder*—for fast-acting antidiarrheal action . . . remarkably effective intestinal astringent, demulcent, toxin absorbent and protectant action. Proved in human practice through control of infectious diarrhea in infants.

**with . . .**

*Bacitracin and Streptomycin*—for specific action against the common gram-positive and gram-negative intestinal pathogens

**effective and safe . . .**

Entromycin has been used successfully in a number of widely separated communities and in a variety of cases of diarrhea in dogs and scours in calves.

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POWDER  
in 2 oz., 4 oz., & pound bottles

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ALLIED LABORATORIES, INC.  
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# right and ready!

## ... to stop bacterial scours quickly and economically.

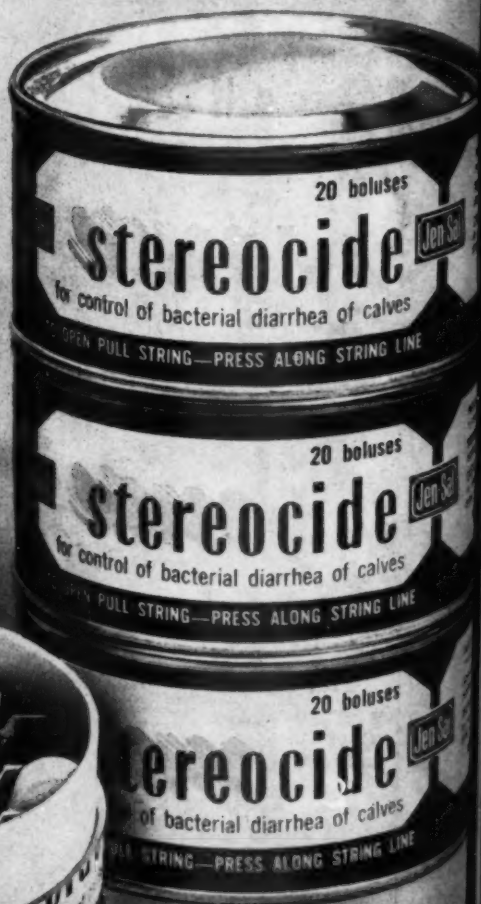
Compare results—compare treatment cost! You'll know why practitioners and clients alike find Stereocide the only *completely right* treatment when scours strikes.

Stereocide offers the economy and convenience of a fast-acting low dose. Field reports indicate that even severe bacterial scouring usually stops after treatment with only four boluses.

Stereocide provides the exclusive therapeutic benefits of Sterosan®\* and Xylocaine®†. The new antimicrobial, Sterosan, combined with neomycin gives a depth to scours treatment not possible with ordinary medications. Both gram-negative and gram-positive infections respond to Stereocide. Xylocaine relieves intestinal cramping and spasms; animals rest comfortably, recover faster.

Stereocide is supplied in foil-lined moisture proof cans of 20 boluses. Buy right, be ready! Order in quantity to take advantage of Jen-Sal's big case lot savings.

Jensen-Salsbery Laboratories, Inc.  
Kansas City, Missouri



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